

**Consumers Energy – Electric Utility Steam Generating Unit
Item 1**

	(a) Capacity* Gross (MW) Net (MW)	(b) Boiler Capacity Heat Input (mmBtu/Hr) **	(c) Status	(d) Retirement Date	(e) Primary Fuel	(f) Particulate Control	(g) Sulfur Dioxide Control	(h) NOx Control	(i) Anticipated Emissions Controls
CAMPBELL PLANT									
Campbell 1	273 260	2571	In Operation	NDP***	Coal	Precipitator 1978/2001	Initiate Low sulfur coal 1988	Low NOx burners 1995/2001	See narrative
Campbell 2	372/377 355/360	3514	In Operation	NDP***	Coal	Precipitator 1978	Initiate Low sulfur coal 1980	Low NOx burners 2000	SCR 2011
Campbell 3	86/1672 825/835	8149	In Operation	NDP***	Coal	Precipitator 1980	Initiate Low sulfur coal 1980	Low NOx burners 1980/2000 SCR 2007	See narrative
COBB PLANT									
Cobb 1	58 54	729	In Operation	NDP***	Gas	-	Natural gas 2000	Low NOx burners 2000	See narrative
Cobb 2	69 65	878	In Operation	NDP***	Gas	-	Natural gas 1999	Low NOx burners 1999	See narrative
Cobb 3	72 68	918	In Operation	NDP***	Gas	-	Natural gas 2000	Low NOx burners 2000	See narrative
Cobb 4	166/170 156/160	1609	In Operation	NDP***	Coal	Precipitator 1970/2000	Initiate Low sulfur coal 1985	-	See narrative
Cobb 5	167/171 156/160	1659	In Operation	NDP***	Coal	Precipitator 1970/2000	Initiate Low sulfur coal 1985	Low NOx burners 2001	See narrative
KARN PLANT									
Karn 1	272 255	2535	In Operation	NDP***	Coal	Precipitator 1959/76	Initiate Low sulfur coal 1980	SCR 2004	Fabric filters 2011
Karn 2	277 260	2626	In Operation	NDP***	Coal	Precipitator 1959/76	Initiate Low sulfur coal 1980	Low NOx burners 1998 SCR 2003	Fabric filters 2011
Karn 3	662 638	7027	In Operation	NDP***	Oil/Gas	-	-	Low NOx burners 2000	See narrative
Karn 4	661 638	7635	In Operation	NDP***	Oil/Gas	-	-	Low NOx burners 1993	See narrative
WEADOCK PLANT									
Weadock 1	-	-	Retired	12/31/1983	-	-	-	-	See narrative
Weadock 2	-	-	Retired	12/31/1983	-	-	-	-	See narrative
Weadock 3	-	-	Retired	12/31/1983	-	-	-	-	See narrative
Weadock 4	-	-	Retired	12/31/1983	-	-	-	-	See narrative
Weadock 5	-	-	Retired	12/31/1983	-	-	-	-	See narrative
Weadock 6	-	-	Retired	12/31/1983	-	-	-	-	See narrative
Weadock 7	166 155	1526	In Operation	NDP***	Coal	Precipitator 1971	Initiate Low sulfur coal 1980	Low Nox burners 2009	
Weadock 8	165 155	1525	In Operation	NDP***	Coal	Precipitator 1971	Initiate Low sulfur coal 1980	Low Nox burners 2010	
WHITING PLANT									
Whiting 1	108 102	1082	In Operation	NDP***	Coal	Precipitator 1973	Initiate Low sulfur coal 1975	Low NOx burners 1996	See narrative
Whiting 2	108 102	1088	In Operation	NDP***	Coal	Precipitator 1973	Initiate Low sulfur coal 1975	Low NOx burners 1997	See narrative
Whiting 3	132 124	1318	In Operation	NDP***	Coal	Precipitator 1973	Initiate Low sulfur coal 1975	Low NOx burners 1996	See narrative

* Based on current Net Demonstrated Capability test (NDC rating Summer/Winter)

** 2008 YTD dispatch heat rate at NDC times NDC generation. (Larger NDC used where applicable)
NDP*** (No Definitive Plan)

Consumers Energy Company

B C Cobb Generating Plant

Muskegon, Michigan

PARTICULATE EMISSION TEST REPORT

Units 4 and 5

September 2003

Testing Conducted by:

Consumers Energy Company

Equipment Performance Testing Section

Report Written by:

LOBush

SUMMARY OF RESULTS

The test results for unit 4 showed an average particulate emission rate of 0.0871 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air. This is below the compliance limit of 0.18 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air.

The test results for unit 5 showed an average particulate emission rate of 0.0520 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air. This is below the compliance limit of 0.18 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air.

B C COBB UNITS 4 & 5

PARTICULATE EMISSION TEST

SUMMARY TABLE

Test #	Date	Unit	Unit Load (gross MW)	Steam Flow (Klb/Hr)	Gas Volume (ACFM)	Outlet Grain Loading (Gr/DSCF)	Particulate Concentration lb/1000 lb Gas	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
1	9/23/2003	4	165	1080	620077.3	0.0555	0.102	0.0890	307.3	57.8	39.6	7.6	95.8
2	9/23/2003	4	165	1080	640972.0	0.0588	0.108	0.0918	305.6	59.7	38.9	10.7	98.6
3	9/23/2003	4	165	1080	635519.3	0.0510	0.094	0.0804	306.0	59.2	39.2	9.6	96.8
Average			165	1080	632189.5	0.0551	0.101	0.0871	306.3	58.9	39.2	9.3	97.1

2.1

Test #	Date	Unit	Unit Load (gross MW)	Steam Flow (Klb/Hr)	Gas Volume (ACFM)	Outlet Grain Loading (Gr/DSCF)	Particulate Concentration lb/1000 lb Gas	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
1	9/24/2003	5	160	1085	655238.8	0.0248	0.048	0.0399	305.9	61.1	43.9	11.6	102.1
2	9/24/2003	5	162	1106	658753.5	0.0281	0.053	0.0443	306.0	61.4	40.9	11.6	100.7
3	9/24/2003	5	160	1106	660129.7	0.0454	0.086	0.0719	303.6	61.5	40.7	10.8	100.4
Average			160.67	1099	658.041	0.0328	0.062	0.0520	305.2	61.3	41.8	11.3	101.1

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

Notes: 1. The particulate emission limit is 0.18 lbs/1000 lbs. gas flow at 50% excess air for units 4 and 5.

2. Oxygen and carbon dioxide is measured at the point of particulate sampling.

3. Flue gas moisture is determined by the condensate method.

4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS

(on dry basis)

Unit	Date	% Moisture	% Ash	Btu
4	9/23/2003	22.10	10.56	12202
5	9/24/2003	23.90	10.47	12084

Consumers Energy Company

B C Cobb Generating Station
Muskegon, Michigan

Unit #4
Particulate Emission Test

Testing Conducted On:
September 27, 2006

Report Submitted: November 13, 2006

Testing Conducted By:
Mr. Larry Bush & Mr. Earl Andree
Consumers Energy Company
Equipment Services Department
Equipment Performance Testing Section

SUMMARY OF RESULTS

During the testing period, Unit 4 burned approximately 370 tons of 100% Western coal. Testing was conducted as close to the interim maximum load of 130 MW as possible, with an average unit load of 131 MW.

Testing was conducted on Unit 4 in order to demonstrate compliance with facility's current ROP (MI-ROP-B2836-2004) particulate matter emission limit. The particulate emission limit for Unit 4 is specified in Condition 1.1 of Tables EUBOILER4 and FGBOILERS4&5 within the ROP, and is summarized below in Table 1.

Table 1. Summary of FGBOILERS4&5 PM Emission Limit

Pollutant	Limit	Time Period/Operating Scenario	Equipment
PM	0.18 pounds per 1,000 pounds exhaust gas, corrected to 50% excess air	At all times (as verifiable through stack testing)	Each individual boiler (Unit 4 & Unit 5)

As shown in Table 2 below, each individual run (0.0218, 0.0252, and 0.0225), as well as the average particulate emission rate of 0.0232 pounds per 1,000 pounds exhaust gas, was below the emission limit of 0.18 pounds per 1,000 pounds. At the interim maximum load of 130 MW, Unit 4 is shown to be in compliance with the ROP particulate matter emission limit.

Table 2. Summary of Unit 4 PM Emission Test Results

Run Number	PM Emission Rates				
	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mmBTU)	Particulate Concentration (lb/hr)	lb/1,000 lbs gas Flow *
Run 1	504,538	0.0150	0.0267	37.9764	0.0218
Run 2	497,276	0.0173	0.0305	43.0777	0.0252
Run 3	500,434	0.0156	0.0272	38.7709	0.0225
Average	500,749	0.0160	0.0281	39.9417	0.0232

* Emissions in pounds of particulate per 1,000 pounds gas flow corrected to 50% excess air.

TEST RESULTS AND DISCUSSION

Each of the three test runs (0.0218 lb/1000 lbs, 0.0252 lb/1000 lbs, and 0.0225 lb/1000 lbs), along with the average (0.0232 lb/1000 lbs), were below the particulate matter emission limit for Unit 4 of 0.18 lb/1,000 lbs. Thus, at the interim maximum load of 130 MW, Unit 4 is shown to be in compliance with the ROP particulate matter emission limit. Refer to the following page for a detailed tabulation of results, including process operating conditions and flue gas conditions.

Three runs were performed, which constitutes a complete test. Sampling was performed at four points in each of four ports. During the first run, each point was sampled for 5 minutes. This resulted in a total volume of less than 30 DSCF. Pursuant to EPA Method 4, which requires a minimum total gas volume of 21 DSCF, this first test run was acceptable. However, to compensate for the reduced exhaust gas flow experienced at the interim maximum load of 130 MW, subsequent sampling was conducted using 6 minutes per point, which resulted in sample volumes greater than 30 DSCF.

There were no process or control equipment upset conditions which occurred during the testing, and no major maintenance was performed on the ESPs during the three month period prior to testing.

Sample calculations for all formulas used in the test report are contained in Attachment 1. All calculation sheets, field data sheets, and calibration sheets are included as Attachments 2, 3, and 6, respectively.

B C COBB UNIT 4

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Gross MW	Steam Flow (klb/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mm btu)	Particulate Concentration lb/hr	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	isokinetic Variation (%)
9/27/2006	4	131	856	509,343	0.0150	0.0267	38.34	0.0218	8.9	309.8	47.5	29.7	11.1	97.1
9/27/2006	4	131	856	497,276	0.0173	0.0305	43.08	0.0252	9.6	310.3	46.3	30.0	11.3	98.4
9/27/2006	4	131	858	505,200	0.0156	0.0272	39.14	0.0225	7.8	310.6	47.1	29.6	11.5	98.2
Average		131	856	503,940	0.0160	0.0281	40.19	0.0232	8.8	310.2	47.0	29.8	11.3	97.9

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

- Notes:
1. Boiler 4 particulate matter emission limit is 0.18 lb./1,000 lbs. gas flow at 50% excess air.
 2. Oxygen and carbon dioxide is measured at the point of particulate sampling.
 3. Flue gas moisture is determined by the condensate method.
 4. Flue gas temperature is the average temperature at the point of particulate sampling.

Consumers Energy Company

B C Cobb Generating Station
Muskegon, Michigan

Unit #5
Particulate Emission Test

Testing Conducted On:
July 19-20, 2006

Report Submitted: September 2006

Testing Conducted By:
Mr. Larry Bush & Mr. Earl Andree
Consumers Energy Company
Equipment Services Department
Equipment Performance Testing Section

SUMMARY OF RESULTS

During the testing period, Unit 5 burned approximately 20% Eastern coal and 80% Western coal. On July 19, 2006, Unit 5 burned a total of 1,941 tons of coal and on July 20, 2006, Unit 5 burned a total of 1,931 tons of coal. Testing was conducted as close to full load as possible (169 MW gross), with an average unit load of 164 MW.

Testing was conducted on Unit 5 in order to demonstrate compliance with facility's current ROP (MI-ROP-B2836-2004) particulate matter emission limit. The particulate emission limit for Unit 5 is specified in Condition I.1 of Tables EUBOILER5 and FGBOILERS4&5 within the ROP, and is summarized below in Table 1.

Table 1. Summary of FGBOILERS4&5 PM Emission Limit

Pollutant	Limit	Time Period/Operating Scenario	Equipment
PM	0.18 pounds per 1,000 pounds exhaust gas, corrected to 50% excess air	At all times (as verifiable through stack testing)	Each individual boiler (Unit 4 & Unit 5)

As shown in Table 2 below, each individual run (0.0898, 0.1376, and 0.1270), as well as the average particulate emission rate of 0.1181 pounds per 1,000 pounds exhaust gas, was below the emission limit of 0.18 pounds per 1,000 pounds. Thus, Unit 5 is in compliance with the ROP particulate matter emission limit.

Table 2. Summary of Unit 5 PM Emission Test Results

Run Number	PM Emission Rates				
	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mmBTU)	Particulate Concentration (lb/hr)	lb/1,000 lbs gas Flow *
Run 1	593,795	0.0615	0.1102	187.1773	0.0898
Run 2	601,067	0.0934	0.1666	288.8726	0.1376
Run 3	595,245	0.0904	0.1589	269.6016	0.1270
Average	596,702	0.0818	0.1452	248.5505	0.1181

* Emissions in pounds of particulate per 1,000 pounds gas flow corrected to 50% excess air.

TEST RESULTS AND DISCUSSION

Each of the three test runs (0.0898 lb/1000 lbs, 0.1376 lb/1000 lbs, and 0.1270 lb/1000 lbs), along with the average (0.1181 lb/1000 lbs), were below the particulate matter emission limit for Unit 5 of 0.18 lb/1,000 lbs. Thus, Unit 5 is in compliance with the ROP particulate matter emission limit. Refer to the following page for a detailed tabulation of results, including process operating conditions and flue gas conditions.

Three runs were performed, which constitutes a complete test. Sampling was performed at five points in each of four ports. During the first run, each point was sampled for 4 minutes. This resulted in a total volume of less than 30 DSCF (28.70 DSCF); however, the measured amount of particulate matter gain was 0.114 g, which is well above the accuracy of the scale used for weighing the samples. Subsequent sampling was conducted using 4.5 minutes per point, which resulted in sample volumes greater than 30 DSCF.

There were no process or control equipment upset conditions which occurred during the testing, and no major maintenance was performed on the ESPs during the three month period prior to testing.

Sample calculations for all formulas used in the test report are contained in Attachment 1. All calculation sheets, field data sheets, and calibration sheets are included as Attachments 2, 3, and 6, respectively.

B C COBB UNIT 5

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Gross MW	Steam Flow (klb/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mm btu)	Particulate Concentration lb/hr	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
7/19/2006	5	164	1152	593,795	0.0515	0.1102	187.18	0.0898	8.4	308.3	55.3	30.4	11.1	94.8
7/19/2006	5	163	1147	601,067	0.0934	0.1666	288.87	0.1376	8.8	307.6	56.0	31.2	10.9	94.0
7/20/2006	5	164	1144	595,245	0.0904	0.1589	269.60	0.1270	9.8	307.9	55.5	27.0	12.9	94.8
Average		164	1148	596,702	0.0818	0.1452	248.55	0.1181	9.0	307.9	55.6	29.5	11.6	94.5

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

- Notes:
1. Boiler 5 particulate matter emission limit is 0.18 lb/1,000 lbs gas flow at 50% excess air.
 2. Oxygen and carbon dioxide are measured at the point of particulate sampling.
 3. Flue gas moisture is determined by the condensate method.
 4. Flue gas temperature is the average temperature at the point of particulate sampling.

Consumers Energy Company
J H Campbell Generating Station
Units 1&2
West Olive, Michigan

Precipitator Particulate Emission Test Report

October 2002

Conducted by:

Consumers Energy Company

Equipment Performance Testing Section

Report written by:
L O Bush

SUMMARY of RESULTS

The test results for Units 1&2 showed a three test average particulate emission rate of 0.0059 lbs particulate per 1000 lbs gas flow at 50% excess air. This is below the compliance limit of 0.154 lbs particulate per 1000 lbs gas flow at 50% excess air as specified in the permit. The results summary is on the following page.

J H CAMPBELL UNITS 1 & 2

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Unit #1 Gross Load (MW)	Unit #2 Gross Load (MW)	Unit #1 Steam Flow (Klb/Hr)	Unit #2 Steam Flow (Klb/Hr)	Outlet Grain Loading (Gr/dSCF)	LB Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (OF)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
10/29/2002	1 & 2	269	358	1984	2625	0.0042	0.0071	7.8	289.2	135.8	45.1	8.9	100.5
10/29/2002	1 & 2	267	357	1966	2632	0.0029	0.0049	7.4	285.6	136.4	48.3	9.0	99.8
10/30/2002	1 & 2	267	356	1982	2595	0.0035	0.0059	8.3	286.0	134.3	42.3	6.0	97.8
Average		268	357	1977	2617	0.0036	0.0059	7.8	286.9	135.5	45.2	7.9	99.4

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

Notes:

1. The particulate emission limit for units 1 and 2 combined is **0.154 lb/1,000 lbs. gas flow at 50% excess air.**
2. Steam flow is from unit 1 only; unit 2 steam flow data was unavailable.
3. Oxygen and carbon dioxide is measured at the point of particulate sampling.
4. Flue gas moisture is determined by the condensate method.
5. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS

(on dry basis)

Unit #	Test #	Date	% Moisture	% Ash	% Sulfur	Btu
1	1 & 2	10/29/2002	N/A	5.12	0.30	11,015
1	3	10/30/2002	N/A	6.34	0.36	11,622
2	1 & 2	10/29/2002	13.5	8.53	0.6	12,715
2	3	10/30/2002	14.1	9.70	0.77	12,383

Consumers Energy Company
J H Campbell Generating Station
Unit #1&2
West Olive, Michigan

Particulate Emission Test Report

September 2005

Conducted by:

Consumers Energy Company
Equipment Performance Testing Section

Summary of Results

The test results for Units 1&2 showed a three test average particulate emission rate of 0.0093 lb particulate per 1000 lbs of gas flow corrected to 50% excess air. This is below the Unit 1 & Unit 2 compliance limits of 0.16 and 0.15 lbs particulate per 1000 lbs of gas flow, respectively, as specified in MI-ROP-B2835-2005. The test summary is on the following page.

J H CAMPBELL UNITS 1 AND 2

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Unit #1 Gross Load (MW)	Unit #2 Gross Load (MW)	Unit #1 Steam Flow (Klbs/hr)	Unit #2 Steam Flow (Klbs/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/MMBtu)	Particulate Concentration lbs/hr	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Excess Air (%)	Isokinetic Variation (%)
9/21/2005	1&2	270	371	1,930	2,683	2,349,742	0.0076	0.0146	93.41	0.0121	10.4	294.6	40.9	97.2
9/22/2005	1&2	270	372	1,900	2,694	2,372,645	0.0056	0.0111	69.32	0.0088	12.0	289.5	39.0	98.4
9/22/2005	1&2	272	372	1,888	2,691	2,420,657	0.0045	0.0089	56.75	0.0071	12.1	290.8	38.6	97.9
Average		271	372	1,906	2,689	2,381,015	0.0059	0.0115	73.16	0.0093	11.5	291.6	39.5	97.9

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

Notes:

1. Units 1&2 share a common stack. All stack data and particulate emission rate data are for Units 1&2 combined.
2. The particulate emission limits for Units 1 and 2 are 0.16 and 0.15 lbs/1,000 lbs gas flow at 50% excess air, respectively.
3. Oxygen and carbon dioxide are measured at the point of particulate sampling.
4. Flue gas moisture is determined by the condensate method.
5. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS

(on dry basis)

Unit #	Date	% Moisture	% Ash	% Sulfur	Btu
1	9/21/2005	25.25	7.33	0.46	12,105
1	9/22/2005	26.58	6.98	0.42	12,034
2	9/21/2005	13.75	9.07	0.78	13,090
2	9/22/2005	13.95	10.27	0.74	12,984

Consumers Energy Company
J H Campbell Generating Station
Unit #3
West Olive, Michigan

Precipitator Particulate Emission Test Report

October 2002

Conducted by:

Consumers Energy Company
Equipment Performance Testing Section

Report written by:
L O Bush

SUMMARY of RESULTS

The test results for Unit 3 showed a three test average particulate emission rate of 0.0163 lbs particulate per million BTU. This is below the compliance limit of 0.10 lbs particulate per million BTU as specified in permit number 199600309. The results summary is on the following page.

J H CAMPBELL 3

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Steam Flow (Klb/Hr)	Gross MW	Gas Volume (ACFM)	Particulate Concentration (lb./mm BTU)	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Gas Moisture (%)	Isokinetic Variation (%)
10/15/2002	5531	831	5,968,912	0.0125	6.45	307.6	62.2	25.7	7.0	99.7
10/15/2002	5928	832	6,039,177	0.0160	6.57	310.9	62.9	25.5	7.4	101.8
10/16/2002	6069	851	6,128,309	0.0203	7.16	302.1	63.8	27.1	8.0	102.0
Average	5843	838	6,045,466	0.0163	6.73	306.9	63.0	26.1	7.5	101.2

Notes:

1. The particulate emission limit is 0.1 lbs/million BTU.
2. Oxygen and carbon dioxide is measured at the point of particulate sampling.
3. Flue gas moisture is determined by the condensate method.
4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS
(on dry basis)

Date	Test #	% Moisture	% Ash	% Sulfur	Btu
10/15/2002	1	18.50	10.8	0.61	12,635
10/15/2002	2	18.50	10.8	0.61	12,635
10/16/2002	3	19.5	10.8	0.57	12,356

Consumers Energy Company
J H Campbell Generating Station
Unit #3
West Olive, Michigan

Particulate Emission Test Report

September 2005

Conducted by:

Consumers Energy Company
Equipment Performance Testing Section

Summary of Results

The test results for JHC 3 showed average particulate emission rates of 0.0094 lb per million Btu and 72 lbs per hour. These emission rates are below the compliance limits of 0.10 lb per million Btu and 370 lbs per hour, respectively, per MI-ROP B2835-2005.

The first test run performed on Unit 3 resulted in particulate in the filter that was accidentally scraped from the test port wall. For this reason, test run 1 was thrown out, and the results of runs 2, 3, & 4 are included in this report. The coal analysis for 9/27 was not obtained due to mechanical problems with the sampling equipment. The summary sheet follows this page.

J H CAMPBELL 3

PARTICULATE EMISSION TEST

SUMMARY TABLES

CAMPBELL 3 TOTAL UNIT CONDITIONS

Date	Test #	Steam Flow (klb/hr)	Total Gas Volume (ACFM)	Total Particulate Concentration		Stack Opacity (%)	Average Gas Temp (°F)	Average Velocity (fps)	Average Flue Excess Air (%)	Average Flue Gas Moisture (%)	Average Isokinetic Variation (%)
				(lb./hr.)	(lb./mm BTU)						
9/27/2005	2	5,859	3,119,790	41.78	0.0094	6.6	319.8	65.0	28.1	10.6	98.96
9/28/2005	3	5,941	3,174,507	95.61	0.0104	6.8	318.5	66.1	27.4	10.0	99.30
9/28/2005	4	6,015	3,221,286	77.26	0.0084	6.7	321.5	67.1	26.9	11.0	99.68
Average		5938.33	3,171,861	71.55	0.0094	6.7	319.9	66.1	27.5	10.5	99.3

CAMPBELL 3 "A" DUCT (SOUTH) CONDITIONS

Date	Test #	Gas Volume (ACFM)	Outlet Grain Loading (Gr/dscf)	Particulate Concentration		Average Gas Temp (°F)	Average Velocity (fps)	Average Flue Excess Air (%)	Average Flue Gas Moisture (%)	Average Isokinetic Variation (%)
				(lb./hr.)	(lb./mm BTU)					
9/27/2005	2	1,573,865	0.0035	28.5447	0.0063	320.92	65.58	26.37	9.10	100.24
9/28/2005	3	1,599,049	0.0058	47.6315	0.0103	320.08	66.63	25.81	10.47	102.29
9/28/2005	4	1,637,582	0.0056	46.3616	0.0098	324.50	68.23	25.79	10.77	102.59
Average		1,603,499	0.0050	40.8459	0.0088	321.83	66.81	25.99	10.11	101.71

CAMPBELL 3 "B" DUCT (SOUTH) CONDITIONS

Date	Test #	Gas Volume (ACFM)	Outlet Grain Loading (Gr/dscf)	Particulate Concentration		Average Gas Temp (°F)	Average Velocity (fps)	Average Flue Excess Air (%)	Average Flue Gas Moisture (%)	Average Isokinetic Variation (%)
				(lb./hr.)	(lb./mm BTU)					
9/27/2005	2	1,545,925	0.0071	55.2607	0.0126	318.63	64.41	29.81	12.01	97.68
9/28/2005	3	1,575,458	0.0059	47.9797	0.0105	316.83	65.64	28.95	9.52	96.32
9/28/2005	4	1,583,704	0.0038	30.9000	0.0069	318.50	65.99	28.06	11.25	96.77
Average		1,568,362	0.0056	44.7135	0.0100	317.99	65.35	28.94	10.93	96.92

Notes:

1. The particulate emission limits are 0.10 lb/million Btu and 370 lbs/hour.
2. Oxygen and carbon dioxide are measured at the point of particulate sampling.
3. Flue gas moisture is determined by the condensate method.
4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS
(on dry basis)

Date	Test #	% Moisture	% Ash	% Sulfur	Btu
9/27/2005	2	N/A	N/A	N/A	N/A
9/28/2005	3&4	20.52	7.65	0.56	12956

Consumers Energy Company

D E Karn Generating Plant

Essexville, Michigan

PARTICULATE EMISSION TEST REPORT

Units 1 and 2

August, 2002

Testing Conducted by:

Consumers Energy Company

Equipment Performance Testing Section

Report Written by:

BCPape

Summary of Results

The test results for unit 1 showed average particulate emission rates of 0.0196 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, and 63.2833 lb/hr. These are below the compliance limits of 0.16 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP number B 2840.

The first test run performed on unit 1 resulted in less than the required amount of metered sample volume. This was because the sample time at each point was incorrect. For this reason, test run 1 was thrown out, and the results of runs 2, 3, & 4 are included in this report.

The test results for unit 2 showed average particulate emission rates of 0.0189 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, and 61.2917 lb/hr. These are below the compliance limits of 0.16 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP number B 2840.

D E KARN UNITS 1 & 2

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Steam Flow (Kib/Hr)	Gas Volume (ACFM)	Outlet Grain Loading (Gr/dSCF)	Particulate Concentration (lb./mm BTU)	Particulate Concentration (LB/Hr)	LB/1000 LB Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
8/6/02	1	1733	950,701	0.0115	0.0209	58.3998	0.0181	9.8	300.4	40.4	38.2	9.5	104.3
8/6/02	1	1728	949,061	0.0138	0.0252	69.6916	0.0218	10.4	300.0	40.4	39.2	9.6	104.7
8/6/02	1	1725	964,218	0.0121	0.0221	61.7586	0.0190	10.4	302.7	41.0	39.0	9.4	104.1
Average		1728.67	954,660	0.0125	0.0227	63.2833	0.0196	10.2	301.0	40.6	38.8	9.5	104.4
8/7/02	2	1914.7	1,060,245	0.0124	0.0242	68.7547	0.0212	8.1	318.3	69.4	49.8	8.7	100.6
8/7/02	2	1910.6	1,045,634	0.0105	0.0204	56.7146	0.0179	8.5	319.9	68.5	50.2	9.3	101.4
8/7/02	2	1944.9	1,068,935	0.0104	0.0199	58.4058	0.0176	9	321.0	70.0	47.7	8.3	100.1
Average		1923.40	1,058,271	0.0111	0.0215	61.2917	0.0189	8.5	319.7	69.3	49.2	8.8	100.7

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

- Notes:
1. The particulate emission limit is 0.16 lbs./1,000 lbs. gas flow at 50% excess air for units 1 and 2.
 2. Oxygen and carbon dioxide is measured at the point of particulate sampling.
 3. Flue gas moisture is determined by the condensate method.
 4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS
(on dry basis)

Date	Unit	% Moisture	% Ash	% Sulfur	Btu
8/6/02	1	10.95	10.56	0.58	12,136
8/6/02	1	10.95	10.56	0.58	12,136
8/6/02	1	10.95	10.56	0.58	12,136
8/7/02	2	7.9	10.9	0.58	12,151
8/7/02	2	7.9	10.9	0.58	12,151
8/7/02	2	7.9	10.9	0.58	12,151



Consumers Energy Company

D E Karn Generating Plant

Essexville, Michigan

PARTICULATE EMISSION TEST REPORT

Units 1 and 2



November 2, 2005

Testing Conducted by:

Consumers Energy Company

Equipment Performance Testing Section

Report Written by:

BEMiska



Summary of Results

The test results for Unit 1 showed average particulate emission rates of 0.01 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air. The average lbs/1,000 lb exhaust gas particulate emission rate is below the compliance limit of 0.16 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP number 199600477.

The test results for Unit 2 showed average particulate emission rates of 0.03 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air. The average lbs/ 1,000 lb exhaust gas particulate emission rate is below the compliance limits of 0.16 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP number 199600477.

D E KARN UNITS 1 & 2

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Gross MW	Steam Flow (klb/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mm btu)	Particulate Concentration (lb/hr)	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
10/25/2005	1	263.3	1952	1,021,464	0.0079	0.0135	40.9959	0.0110	12.5	312.3	43.4	25.6	11.2	98.9
10/25/2005	1	269.6	1984	996,710	0.0112	0.0197	58.4123	0.0160	14.7	303.9	42.4	26.0	10.1	98.1
10/25/2005	1	268.5	1977.9	995,393	0.0125	0.0218	64.2125	0.0177	13.4	305.0	42.3	26.2	10.6	98.5
Average		267.1	1971.3	1,004,523	0.0105	0.0183	54.5402	0.0149	13.5	307.1	42.7	25.9	10.7	98.5
10/20/2005	2	282.6	1997.6	1,048,117	0.0201	0.0395	108.0790	0.0321	12.8	324.3	68.6	39.9	9.3	100.4
10/20/2005	2	282.4	1987.3	1,021,219	0.0232	0.0452	120.9548	0.0368	12	328.1	66.9	39.2	9.2	99.8
10/20/2005	2	278.9	1992	1,020,574	0.0215	0.0423	112.3609	0.0343	11.7	327.1	66.8	39.9	9.2	98.6
Average		281.3	1992.30	1,029,970	0.0216	0.0423	113.7982	0.0344	12.2	326.5	67.5	39.7	9.2	99.6

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

- Notes:
- 1 The particulate emission limit is 0.16 lbs/1,000 lbs gas flow at 50% excess air for Units 1 and 2.
 - 2 Oxygen and carbon dioxide are measured at the point of particulate sampling.
 - 3 Flue gas moisture is determined by the condensate method.
 - 4 Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS (on dry basis)

Date	Unit	% Moisture	% Ash	% Sulfur	Btu
10/25/2005	1	14.21	8.15	0.63	12,564
10/25/2005	1	14.21	8.15	0.63	12,564
10/25/2005	1	14.21	8.15	0.63	12,564
10/20/2005	2	11.78	9.8	0.66	12,456
10/20/2005	2	11.78	9.8	0.66	12,456
10/20/2005	2	11.78	9.8	0.66	12,456

Consumers Energy Company
J C Weadock Generating Plant
Essexville, Michigan

PARTICULATE EMISSION TEST REPORT

Units 7 and 8

October, 2002

Testing Conducted by:

Consumers Energy Company

Equipment Performance Testing Section

Report Written by:

BCPape

2008_00008746

Summary of Results

The test results for unit 7 showed average particulate emission rates of 0.0279 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, and 62.7025 lb/hr. These are below the compliance limits of 0.18 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP number B 2840.

The test results for unit 8 showed average particulate emission rates of 0.0486 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, and 106.4456 lb/hr. These are below the compliance limits of 0.18 lbs particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP number B 2840.

J C WEADOCK UNITS 7 & 8

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Steam Flow (Klb/Hr)	Gas Volume (ACFM)	Outlet Grain Loading (Gr/dSCF)	Particulate Concentration (lb./mm BTU)	Particulate Concentration (lb/Hr)	LB/1000 LB Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
10/22/02	7	1150	600,592	0.0234	0.0382	70.7723	0.0318	13	309.2	28.4	21.8	10.6	104.7
10/22/02	7	1150	617,247	0.0184	0.0294	56.7013	0.0245	14	309.1	29.2	19.8	11.7	105.5
10/22/02	7	1150	602,081	0.0202	0.0323	60.6338	0.0273	13	308.3	28.5	22.2	11.8	104.7
Average		1150.00	606,640	0.0207	0.0333	62.7025	0.0279	13.3	308.9	28.7	21.3	11.4	105.0
10/23/02	8	1050	599,267	0.0430	0.0756	132.3088	0.0612	15	303.5	28.4	26.7	10.9	102.0
10/23/02	8	1050	600,010	0.0281	0.0479	88.5561	0.0398	14	303.4	28.4	24.7	8.6	101.4
10/23/02	8	1060	604,256	0.0317	0.0555	98.4719	0.0448	13	303.9	28.6	25.8	10.7	100.8
Average		1056.67	601,178	0.0343	0.0597	106.4456	0.0486	14.0	303.6	28.4	25.7	10.0	101.4

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

per emission limit is 0.18 lbs./1,000 lbs. gas flow at 50% excess air for units 7 and 8.

Gas is measured at the point of particulate sampling.

Determined by the condensate method.

Here is the average temperature at the point of particulate sampling.

COAL ANALYSIS

(on dry basis)

Test #	Date	% Moisture	% Ash	% Sulfur	Btu
7	10/22/02	15.49	8.08	0.63	12,314
7	10/22/02	15.49	8.08	0.63	12,314
7	10/22/02	15.49	8.08	0.63	12,314
8	10/23/02	17.12	8.18	0.46	12,293
8	10/23/02	17.12	8.18	0.46	12,293
8	10/23/02	17.12	8.18	0.46	12,293

Consumers Energy Company
J C Weadock Generating Plant
Essexville, Michigan

PARTICULATE EMISSION TEST REPORT

Units 7 and 8

November, 2005

Testing Conducted by:

Consumers Energy Company

Equipment Performance Testing Section

Report Written by:

BCPape

Summary of Results

The test results for Unit 7 showed an average particulate emission rate of 0.04 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air. The average lb particulate per 1,000 lbs exhaust gas emission rate is below the emission limit of 0.18 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP No. 199600477.

The test results for Unit 8 showed an average particulate emission rate of 0.04 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air. The average lb particulate per 1,000 lbs exhaust gas emission rate is below the emission limit of 0.18 lb particulate per 1,000 lbs gas flow, corrected to 50% excess air, as specified in ROP No. 199600477.

J C WEADOCK UNITS 7 & 8

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Gross MW	Steam Flow (Klbs/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lbs/MMBtu)	Particulate Concentration (lbs/hr)	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
10/10/2005	7	160.58	1112.6	610,021	0.0469	0.0776	146.1921	0.0641	15.6	303.3	28.9	21.9	10.6	97.2
10/12/2005	7	161.16	1127.34	599,306	0.0152	0.0253	46.6669	0.0208	21.28	302.7	28.4	22.0	10.4	95.5
10/13/2005	7	162.81	1139.24	635,068	0.0270	0.0452	86.3282	0.0369	15.29	303.8	30.1	22.7	11.9	94.5
Average		161.52	1126.39	614,798	0.0297	0.0494	93.0624	0.0406	17.4	303.3	29.1	22.2	11.0	95.7
10/11/2005	8	161.05	1028.99	630,721	0.0366	0.0628	119.5276	0.0525	13.4	294.2	29.8	27.7	10.6	96.6
10/11/2005	8	159.94	1019.85	632,743	0.0218	0.0376	71.1912	0.0313	14.97	297.5	29.9	27.8	10.2	96.4
10/12/2005	8	159.61	1022.51	649,764	0.0196	0.0338	64.6583	0.0275	15.14	300.3	30.7	25.8	11.4	96.3
Average		160.20	1023.78	637,743	0.0260	0.0447	85.1257	0.0371	14.5	297.3	30.2	27.1	10.7	96.4

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

- Notes:
1. The particulate emission limit is 0.18 lbs/1,000 lbs gas flow at 50% excess air for Units 7 and 8.
 2. Oxygen and carbon dioxide are measured at the point of particulate sampling.
 3. Flue gas moisture is determined by the condensate method.
 4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS
(on dry basis)

Unit #	Test #	Date	% Moisture	% Ash	% Sulfur	Btu
7	1	10/10/2005	17.43	9.26	0.79	12,353
7	2	10/12/2005	17.35	9.72	0.74	12,286
7	3	10/13/2005	18.72	9.28	0.76	12,326
8	1	10/11/2005	18.91	10.31	0.73	12,244
8	2	10/11/2005	18.91	10.31	0.73	12,244
8	3	10/12/2005	18.34	10.07	0.74	12,269

Consumers Energy Company

J C Weadock Generating Plant
Essexville, Michigan

Units #7 & #8
Particulate Emission Test

Testing Conducted On:
March 12-14, 2008

Report Submitted: April 2008

Testing Conducted By:
Mr. Brian Pape & Mr. Brian Miska
Consumers Energy Company
Equipment Services Department
Equipment Performance Testing Section

SUMMARY OF RESULTS

During the testing period, Unit 7 burned approximately 23% Eastern coal and 77% Western coal. Unit 7 burned a total of 108 tons of coal per hour and on March 12 and 13, 2008. Testing was conducted as close to full load as possible (165 MW gross), with an average unit load of 156 MW.

During the testing period, Unit 8 burned approximately 23% Eastern coal and 77% Western coal. Unit 8 burned a total of 108 tons of coal per hour on March 13 and 14, 2008. Testing was conducted as close to full load as possible (165 MW gross), with an average unit load of 156 MW.

Testing was conducted on Units 7 & 8 in order to demonstrate compliance with facility's current ROP (No. 199600477) particulate matter emission limit. The particulate emission limit for Unit 7 is specified in Condition II.B of Table E-3.1 EGWEADOCK7. The particulate emission limit for Unit 8 is specified in Condition II.B of Table E-3.3 EGWEADOCK8. The permitted limit is summarized below in Table 1.

Table 1. Summary of EGWEADOCK7 & EGWEADOCK8 PM Emission Limit

Pollutant	Limit
PM	0.18 pounds per 1,000 pounds exhaust gas, corrected to 50% excess air

As shown in Table 2 below, each individual run, as well as the average particulate emission rate, was below the emission limit of 0.18 pounds per 1,000 pounds for Unit 7. Thus, Unit 7 is in compliance with the ROP particulate matter emission limit.

Table 2. Summary of Unit 7 PM Emission Test Results

Run Number	PM Emission Rates				
	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mmBTU)	Particulate Concentration (lb/hr)	lb/1,000 lbs gas Flow *
Run 1	609,552	0.0298	0.0505	90.5906	0.0413
Run 2	610,303	0.0348	0.0582	104.9724	0.0478
Run 3	611,079	0.0421	0.0719	126.2563	0.0577
Average	610,311	0.0356	0.0602	107.2731	0.0489

* Emissions in pounds of particulate per 1,000 pounds gas flow corrected to 50% excess air.

As shown in Table 3 below, each individual run, as well as the average particulate emission rate, was below the emission limit of 0.18 pounds per 1,000 pounds for Unit 8. Thus, Unit 8 is in compliance with the ROP particulate matter emission limit.

Table 3. Summary of Unit 8 PM Emission Test Results

Run Number	PM Emission Rates				
	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/mmBTU)	Particulate Concentration (lb/hr)	lb/1,000 lbs gas Flow *
Run 1	577,771	0.0713	0.1229	209.4049	0.0992
Run 2	605,841	0.0563	0.0954	174.5567	0.0776
Run 3	583,104	0.0502	0.0864	148.7094	0.0699
Average	588,906	0.0593	0.1016	177.5570	0.0822

* Emissions in pounds of particulate per 1,000 pounds gas flow corrected to 50% excess air.

TEST RESULTS AND DISCUSSION

Each of the three test runs, along with the average, were below the particulate matter emission limit for Units 7 & 8 0.18 lb/1,000 lbs. Thus, Units 7 & 8 are both in compliance with the ROP particulate matter emission limit. Refer to the following page for a detailed tabulation of results, including process operating conditions and flue gas conditions.

Three runs were performed, which constitutes a complete test. Sampling was performed at four points in each of fourteen ports. During each run, each point was sampled for 2 minutes. This resulted in sample volumes greater than 30 DSCF.

There were no process or control equipment upset conditions which occurred during the testing, and no major maintenance was performed on the ESPs during the three month period prior to testing.

Sample calculations for all formulas used in the test report are contained in Attachment 1. All calculation sheets, field data sheets, and calibration sheets are included as Attachments 2, 4, 3, and 5, respectively.

J C WEADOCK UNITS 7 & 8

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Gross MW	Steam Flow (Klbs/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lbs/MMBtu)	Particulate Concentration (lbs/hr)	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Flue Gas Velocity (fps)	Excess Air (%)	Flue Gas Moisture (%)	Isokinetic Variation (%)
3/12/2008	7	157	1033.01	609,552	0.0298	0.0505	90.5906	0.0413	14	308.6	28.8	23.6	10.7	98.8
3/12/2008	7	156	1028.58	610,303	0.0348	0.0582	104.9724	0.0478	12	307.9	28.9	23.5	11.5	98.4
3/13/2008	7	156	1068.79	611,079	0.0421	0.0719	126.2563	0.0577	16	309.9	28.9	22.7	11.2	97.9
Average		156.33	1043.46	610,311	0.0356	0.0602	107.2731	0.0489	14.0	308.8	28.9	23.3	11.1	98.4
3/13/2008	8	154	1022.44	577,771	0.0713	0.1229	209.4049	0.0992	17	288.8	27.3	23.9	10.6	96.1
3/14/2008	8	157	973.37	605,841	0.0563	0.0954	174.5567	0.0776	16	285.8	28.7	23.3	10.9	95.9
3/14/2008	8	156	973.95	583,104	0.0502	0.0864	148.7094	0.0699	16	288.0	27.6	24.4	11.1	97.1
Average		155.67	989.92	588,906	0.0593	0.1016	177.5570	0.0822	16.3	287.5	27.9	23.8	10.8	96.4

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

- Notes:
1. The particulate emission limit is 0.18 lbs/1,000 lbs gas flow at 50% excess air for Units 7 and 8.
 2. Oxygen and carbon dioxide are measured at the point of particulate sampling.
 3. Flue gas moisture is determined by the condensate method.
 4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS
(on dry basis)

Unit #	Test #	Date	% Moisture	% Ash	% Sulfur	Btu
7	1	3/12/2008	15.19	8.08	0.6	12,372
7	2	3/12/2008	15.95	10.16	0.57	12,064
7	3	3/13/2008	15.37	8.32	0.56	12,289
8	1	3/13/2008	15.65	7.37	0.54	12,576
8	2	3/14/2008	13.27	8.35	0.56	12,317
8	3	3/14/2008	19.21	9.82	0.58	12,204

Consumers Energy Company

J H Campbell Generating Station
West Olive, Michigan

Unit 3
Particulate Emission Test

Testing Conducted On:
September 23-24, 2008

Report Submitted: November 2008

Testing Conducted By:
Mr. Larry Bush & Mr. Earl Andree
Consumers Energy Company
Equipment Services Department
Equipment Performance Testing Section

SUMMARY OF RESULTS

During the testing period, Unit 3 burned 100% Western coal. On September 23 and 24, 2008, Unit 3 burned an average of 431 tons of coal per hour and 438 tons of coal per hour, respectively. Testing was conducted as close to full load as possible (880 MW gross), with an average gross unit load of 838 MW.

Testing was conducted on Unit 3 in order to demonstrate compliance with facility's current ROP (No. MI-ROP-B2835-2005b) particulate matter emission limit. The particulate matter emission limits for Unit 3 are specified in Conditions I.2 and I.3 of Table EUBOILER3. The permitted limit is summarized below in Table 1.

Table 1. Summary of EUBOILER3 PM Emission Limit

Pollutant	Limit
PM	0.10 pound per million Btu heat input
PM	370 pounds per hour

As shown in Table 2 below, the combined flow-weight average from each individual run of ducts A and B, was below the emission limit of 0.10 pound per million Btu heat input and 370 pounds per hour for Unit 3. Thus, Unit 3 is in compliance with the ROP particulate matter emission limit.

Table 2. Summary of Unit 3 PM Emission Test Results

Run Number	PM Emission Rates				
	Steam Flow (klb/hr)	Total Gas Volume (acfm)	Particulate Emission Rate (lb/mmBTU)	Particulate Emission Rate (lb/hr)	Stack Opacity (%)
Run 1	5,676	3,118,663	0.0026	21.93	2.8
Run 2	5,679	3,186,809	0.0038	33.42	2.6
Run 3	5,686	3,203,095	0.0044	37.74	3.1
Average	5,680	3,169,522	0.0036	31.03	2.8

TEST RESULTS AND DISCUSSION

Each of the three test runs, along with the average, were below the particulate matter emission limit for Unit 3. Thus, Unit 3 is in compliance with the ROP particulate matter emission limit. Refer to the following page for a detailed tabulation of results, including process operating conditions and flue gas conditions.

There were no process or control equipment upset conditions which occurred during the testing, and no major maintenance was performed on the ESP during the three month period prior to testing.

Sample calculations for all formulas used in the test report are contained in Attachment 1. All calculation sheets, field data sheets, and calibration sheets are included as Attachments 2, , 3, and 6, respectively.

J H CAMPBELL 3
PARTICULATE EMISSION TEST

SUMMARY TABLES

CAMPBELL 3 TOTAL UNIT CONDITIONS

Date	Test #	Steam Flow (klb/hr)	Total Gas Volume (ACFM)	Total Particulate Concentration		Stack Opacity (%)	Average Gas Temp (°F)	Average Velocity (fps)	Average Flue Excess Air (%)	Average Flue Gas Moisture (%)	Average Isokinetic Variation (%)
				(lb./hr.)	(lb./mm BTU)						
9/23/2008	1	5,676	3,118,663	21.93	0.0026	2.8	329.8	65.0	34.6	10.1	95.64
9/23/2008	2	5,679	3,186,809	33.42	0.0038	2.6	335.3	66.4	37.2	9.2	93.04
9/24/2008	3	5,686	3,203,095	37.74	0.0044	3.1	328.0	66.7	35.4	11.0	96.71
Average		5680.33	3,169,522	31.03	0.0036	2.8	331.0	66.0	35.7	10.1	95.1

CAMPBELL 3 "A" DUCT (SOUTH) CONDITIONS

Date	Test #	Gas Volume (ACFM)	Outlet Grain Loading (Gr/dscf)	Particulate Concentration		Average Gas Temp (°F)	Average Velocity (fps)	Average Flue Excess Air (%)	Average Flue Gas Moisture (%)	Average Isokinetic Variation (%)
				(lb./hr.)	(lb./mm BTU)					
9/23/2008	1	1,567,605	0.0014	10.8776	0.0025	328.13	65.32	31.49	10.78	97.44
9/23/2008	2	1,592,154	0.0025	20.5307	0.0047	332.21	66.34	38.11	8.79	93.69
9/24/2008	3	1,602,311	0.0025	20.3938	0.0048	324.38	66.76	36.41	11.20	98.17
Average		1,587,356	0.0021	17.2674	0.0040	328.24	66.14	35.34	10.26	96.43

CAMPBELL 3 "B" DUCT (SOUTH) CONDITIONS

Date	Test #	Gas Volume (ACFM)	Outlet Grain Loading (Gr/dscf)	Particulate Concentration		Average Gas Temp (°F)	Average Velocity (fps)	Average Flue Excess Air (%)	Average Flue Gas Moisture (%)	Average Isokinetic Variation (%)
				(lb./hr.)	(lb./mm BTU)					
9/23/2008	1	1,551,059	0.0014	11.0550	0.0026	331.46	64.63	37.62	9.39	93.84
9/23/2008	2	1,594,655	0.0016	12.8914	0.0029	338.38	66.44	36.29	9.53	92.39
9/24/2008	3	1,600,785	0.0021	17.3454	0.0040	331.67	66.70	34.38	10.89	95.25
Average		1,582,166	0.0017	13.7639	0.0032	333.83	65.92	36.10	9.94	93.82

Notes:

1. The particulate emission limits are 0.10 lb/million Btu and 370 lbs/hour.
2. Oxygen and carbon dioxide are measured at the point of particulate sampling.
3. Flue gas moisture is determined by the condensate method.
4. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS
(on dry basis)

Date	Test #	% Moisture	% Ash	% Sulfur	Btu
9/23/2008	1&2	24.10	8.07	N/A	11871
9/24/2008	3	24.45	5.60	0.30	12161

Consumers Energy Company

J H Campbell Generating Station
West Olive, Michigan

Units 1&2
Particulate Emission Test

Testing Conducted On:
October 7-8, 2008

Report Submitted: November 2008

Testing Conducted By:
Mr. Larry Bush & Mr. Earl Andree
Consumers Energy Company
Equipment Services Department
Equipment Performance Testing Section

SUMMARY OF RESULTS

During the testing period, Unit 1 burned 100% Western coal and Unit 2 burned a blend of 60% Eastern and 40% Western coal. On October 7th, Unit 1 burned an average of 137 tons of coal per hour and Unit 2 burned an average of 128 tons per hour of coal. On October 8th, Unit 1 burned an average of 135 tons of coal per hour and Unit 2 burned an average of 131 tons per hour of coal. Testing was conducted as close to full load as possible (274 MW gross-Unit 1 and 378 MW gross-Unit 2), with an average unit load of 271 and 372 MW, respectively.

Testing was conducted on the combined exhaust from Units 1 & 2 in order to demonstrate compliance with facility's current ROP (No. MI-ROP-B2835-2005b) particulate matter emission limit. The particulate matter emission limits for Units 1 & 2 are specified in Condition I.1 of Tables EUBOILER1 and EUBOILER2. The permitted limit is summarized below in Table 1.

Table 1. Summary of EUBOILER1 and EUBOILER2 PM Emission Limits

Unit	Pollutant	Limit
1	PM	0.16 pound per 1,000 pounds exhaust gas, corrected to 50% excess air
2	PM	0.15 pound per 1,000 pounds exhaust gas, corrected to 50% excess air

As shown in Table 2 below, each individual run, as well as the average particulate emission rate, was below the emission limits for Unit 1 and Unit 2 of 0.16 and 0.15 pounds per 1,000 pounds exhaust gas, corrected to 50% excess air, respectively. Thus, Units 1 and 2 are in compliance with the ROP particulate matter emission limit.

Table 2. Summary of Units 1 & 2 PM Emission Test Results

Run Number	Unit 1		Unit 2		Combined	Particulate Emission Rate (lb/1000 lbs Gas Flow*)	Stack Opacity (%)
	Gross Load (MW)	Steam Flow (1000 lbs/hr)	Gross Load (MW)	Steam Flow (1000 lbs/hr)	Gas Volume (acfm)		
Run 1	271.5	1803.0	375.5	2614.0	2,306,217	0.0014	4.0
Run 2	272.0	1811.0	366.2	2673.8	2,295,372	0.0018	4.0
Run 3	270.5	1815.7	373.0	2657.0	2,339,755	0.0016	4.0
Average	271	1809.9	372	2648.3	2,313,781	0.0016	4.0

* Emissions in pounds of particulate per 1,000 pounds gas flow, corrected to 50% excess air.

TEST RESULTS AND DISCUSSION

Each of the three test runs, along with the average, were below the particulate matter emission limit for Units 1 & 2. Thus, Units 1 & 2 are in compliance with the ROP particulate matter emission limit. Refer to the following page for a detailed tabulation of results, including process operating conditions and flue gas conditions.

There were no control equipment upset conditions which occurred during the testing, and no major maintenance was performed on the ESP during the three month period prior to testing. A mill tripped offline on Unit 2 during testing, however it was brought back up within 15 minutes.

Sample calculations for all formulas used in the test report are contained in Attachment 1. All calculation sheets, field data sheets, and calibration sheets are included as Attachments 2, 3, and 6, respectively.

J H CAMPBELL UNITS 1 AND 2

PARTICULATE EMISSION TEST

SUMMARY TABLE

Date	Unit	Unit #1 Gross Load (MW)	Unit #2 Gross Load (MW)	Unit #1 Steam Flow (Klbs/hr)	Unit #2 Steam Flow (Klbs/hr)	Gas Volume (acfm)	Outlet Grain Loading (gr/dscf)	Particulate Concentration (lb/MMBtu)	Particulate Concentration lbs/hr	lb/1000 lbs Gas Flow *	Average Stack Opacity (%)	Flue Gas Temp (°F)	Excess Air (%)	Isokinetic Variation (%)
10/7/2008	1&2	271.5	375.5	1803.0	2614.0	2,306,217	0.0008	0.0016	10.73	0.0014	4.0	283.1	39.7	102.6
10/7/2008	1&2	272.0	366.2	1811.0	2673.8	2,295,372	0.0011	0.0022	14.05	0.0018	4.0	285.8	39.5	101.8
10/8/2008	1&2	270.5	373.0	1815.7	2657.0	2,339,755	0.0010	0.0020	12.65	0.0016	4.0	284.1	42.3	100.0
Average		271	372	1809.9	2648.3	2,313,781	0.0010	0.0020	12.48	0.0016	4.0	284.3	40.5	101.5

* Emissions in pounds of particulate per 1000 pounds gas flow corrected to 50 % excess air.

Notes:

1. Units 1&2 share a common stack. All stack data and particulate emission rate data are for Units 1&2 combined.
2. The particulate emission limits for Units 1 and 2 are 0.16 and 0.15 lbs/1,000 lbs gas flow at 50% excess air, respectively.
3. Oxygen and carbon dioxide are measured at the point of particulate sampling.
4. Flue gas moisture is determined by the condensate method.
5. Flue gas temperature is the average temperature at the point of particulate sampling.

COAL ANALYSIS

(on dry basis)

Unit #	Date	% Moisture	% Ash	% Sulfur	Btu
1	10/7/2008	27.2	5.49	0.28	12,256
1	10/8/2008	26.55	8.68	0.30	12,963
2	10/7/2008	15.92	10.22	0.64	12,637
2	10/8/2008	16.45	9.39	0.65	12,830

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COPY 8 OF 13

CONFIDENTIAL

BUSINESS INFORMATION

The attached document contains data claimed to be confidential business information (CBI). CBI may not be disclosed or copied for release to another party. Any excerpts or summaries must also be treated as CBI. If you willfully disclose CBI to any person not authorized to receive it, you may be liable for a disciplinary action with penalties ranging up to and including dismissal. In addition, disclosure of CBI or violation of security procedures may subject you to a fine of up to \$1,000.00 and/or imprisonment for up to one year.

DO NOT DETACH

Appendix G



JOHN ENGLER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



RUSSELL J. HARDING
DIRECTOR

May 28, 2002

Dr. A. Kent Evans, Director of Air Quality
Consumers Energy Company
212 West Michigan Avenue
Jackson, MI 49201

Dear Dr. Evans:

This letter is in reference to your Permit to Install application for adding selective catalytic reduction systems to existing Units 2 and 3 (State Registration Number B2835) located at the JH Campbell Plant, West Olive, Michigan. This application, identified as No. 337-01, has been evaluated and approved by the Air Quality Division, pursuant to the delegation of authority from the Michigan Department of Environmental Quality.

This approval is based upon and subject to compliance with all administrative rules of the Department and conditions stipulated in the attached supplement. Please review these conditions thoroughly so that you may take the actions necessary to ensure compliance with all of these conditions.

Please contact me if you have any questions regarding this permit.

Sincerely,

David Ferrier
Thermal Process Unit
Permit Section
Air Quality Division
517-373-7079

DF:CD

Attachments

cc: Ms. Heidi Hollenbach, District Supervisor



AIR USE PERMIT APPLICATION

For authority to install, construct, reconstruct, relocate, modify, or alter process, fuel-burning or refuse burning equipment and/or control equipment (permits to install are required by administrative rules pursuant to section 5505 of act 451, p.a. 1994 as amended).

FOR DEQ USE ONLY
APPLICATION NUMBER

337-01

ease type or print clearly. Instructions are available on the Internet at <http://www.deq.state.mi.us/aqd/>, or call the Air Quality Division at 517-373-7023.

APPLICANT NAME: (Business License Name of Corporation, Partnership, Individual Owner, Government

Agency)
Consumers Energy Company

APPLICANT ADDRESS: (Number and Street)

12 West Michigan Avenue

CITY: (City or Village)

Jackson

STATE:

MI

ZIP CODE:

49201

RECEIVED

NOV 09 2001

AIR QUALITY DIV.

EQUIPMENT OR PROCESS LOCATION: (Number and Street) (If different than item 2)

H Campbell Plant

COUNTY:

Ottawa

CITY: (City or Village)

West Olive

ZIP CODE:

49460

GENERAL NATURE OF BUSINESS: Public Utility

EQUIPMENT OR PROCESS DESCRIPTION: A Description MUST Be Provided Here. (Attach additional sheets, if necessary. Include Source Classification Codes (SCC))

H Campbell, Units 2&3, Pulverized Coal-Fired Electric Generating Units: (SCC 1-01-002-02)

This application seeks authorization for installation of Selective Catalytic Reduction systems and ancillary equipment to meet current and future NOx emission requirements. This project constitutes a pollution control project and is, therefore, exempt from Federal New Source requirements (NSPS and NSR) as further explained in Attachment A.

Attachment A - Project Description and Regulatory Applicability

Attachment B - Air Quality Modeling Analysis

5. FACILITY CODES:

STANDARD INDUSTRIAL CLASSIFICATION (SIC)

4 9 1 1

STATE REGISTRATION (EMISSION INVENTORY) NO.:

B 2 8 3 5

7. ACTION AND TIMING: (Enter dates for those which

ESTIMATED STARTING DATE

ESTIMATED COMPLETION DATE

INSTALLATION, CONSTRUCTION,
RECONSTRUCTION OR ALTERATION:

3/1/02

6/1/04

RELOCATION:

CHANGE OF OWNERSHIP:

8. NAME OF PRIOR OWNER, IF ANY:

PRIOR AIR USE PERMIT NUMBER, IF ANY:

199600309

9. AUTHORIZED FIRM MEMBER CERTIFICATION:

PRINTED OR TYPED NAME:

A Kent Evans

TITLE:

Director Air Quality

PHONE NUMBER: (Include Area Code)

517-788-0404

SIGNATURE:

DATE:

11/6/01

10. CONTACT PERSON NAME: (If different than name in item 9)

Richard J Savoie

PHONE NUMBER: (Include Area Code)

517-788-0098

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

DATE PERMIT TO INSTALL APPROVED:

DATE APPLICATION / PERMIT VOIDED:

DATE APPLICATION / PERMIT DENIED:

SIGNATURE:

SIGNATURE:

SIGNATURE:

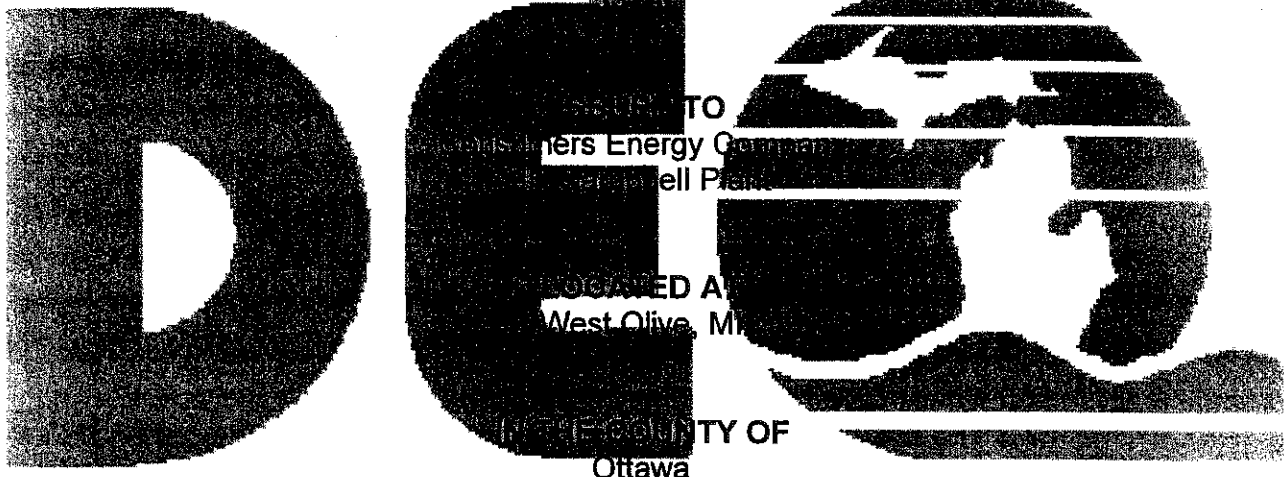
*SUBJECT TO COMPLIANCE WITH ALL DEPARTMENT RULES AND THE CONDITIONS STIPULATED IN THE ATTACHED SUPPLEMENT.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

May 20, 2002

NEW SOURCE REVIEW PERMIT TO INSTALL

337.01



STATE REGISTRATION NUMBER
B2835

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Part 5505(1) of Article II, Chapter I, Part 55 (Air Pollution Control) of P.A. 451 of 1994. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

11/09/01

DATE PERMIT TO INSTALL APPROVED:

05/20/02

SIGNATURE:

Lynn Fidler

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

NEW SOURCE REVIEW PERMIT TO INSTALL

Table of Contents

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Alphabetical Listing of Common Abbreviations / Acronyms	2
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Common Abbreviations / Acronyms Used in this Permit to Install

Common Acronyms		Pollutant/Measurement Abbreviations	
AQD	Air Quality Division	BTU	British Thermal Unit
ANSI	American National Standards Institute	°C	Degrees Celsius
BACT	Best Available Control Technology	CO	Carbon Monoxide
CAA	Clean Air Act	dscf	Dry standard cubic foot
CEM	Continuous Emission Monitoring	dscm	Dry standard cubic meter
CFR	Code of Federal Regulations	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H ₂ S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	HP	Horsepower
GC	General Condition	lb	Pound
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	NO _x	Oxides of Nitrogen
MAP	Malfunction Abatement Plan	PM	Particulate Matter
MDEQ	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns diameter
MIOSHA	Michigan Occupational Safety & Health Administration	pph	Pound per hour
MSDS	Material Safety Data Sheet	ppm	Parts per million
NESHAP	National Emission Standard for Hazardous Air Pollutants	ppmv	Parts per million by volume
NSPS	New Source Performance Standards	ppmw	Parts per million by weight
NSR	New Source Review	psia	Pounds per square inch absolute
PS	Performance Specification	psig	Pounds per square inch gauge
PSD	Prevention of Significant Deterioration	scf	Standard cubic feet
PTE	Permanent Total Enclosure	sec	Seconds
PTI	Permit to Install	SO ₂	Sulfur Dioxide
RACT	Reasonable Available Control Technology	THC	Total Hydrocarbons
SC	Special Condition	tpy	Tons per year
SCR	Selective Catalytic Reduction	µg	Microgram
SRN	State Registration Number	VOC	Volatile Organic Compounds
TAC	Toxic Air Contaminant	yr	Year
VE	Visible Emissions		

* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, altered, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **[R336.1201(1)]**
2. If the installation, reconstruction, relocation, or alteration of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the person to whom this permit was issued, or the designated authorized agent, shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, PO Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or alteration of the equipment allowed by this Permit to Install. **[R336.1201(4)]**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **[R336.1201(6)(b)]**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **[R336.1201(8), Section 5510 of Act 451, PA 1994]**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R336.1219. The written request shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **[R336.1219]**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **[R336.1901]**
7. The owner or operator of a source, process, or process equipment shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant in excess of standards for more than one hour, or of any air contaminant in excess of standards for more than two hours, as required in this rule, to the District Supervisor, Air Quality Division. The notice shall be provided no later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the District Supervisor within ten days, with the information required in this rule. **[R336.1912]**
8. Approval of this permit does not exempt the person to whom this permit was issued from complying with any future applicable requirements which may be promulgated under Part 55 of Act 451, PA 1994 or the Federal Clean Air Act.

9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of Act 451, PA 1994, and the rules promulgated thereunder.
11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R336.1301, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R336.1303. [R336.1301]
 - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
 - b) A visible emission limit specified by an applicable federal new source performance standard.
 - c) A visible emission limit specified as a condition of this permit to install.
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R336.1370(2). [R336.1370]
13. Except as allowed by Rule 285 (a), (b), and (c), permittee shall not substitute any fuels, coatings, nor raw materials for those described in the application and allowed by this permit, nor make changes to the process or process equipment described in the application, without prior notification to and approval by the Air Quality Division. [R336.1201(1)]
14. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R336.2001 and R336.2003, under any of the conditions listed in R336.2001. [R336.2001]

SPECIAL CONDITIONS

Emission Unit Identification

Emission Unit ID	Emission Unit Description	Stack Identification
EGBOILER2	Boiler #2. A 3,560 mmBtu/hr cell burner fired boiler with fuel oil startup capability.	SVBLR12
EGBOILER3	Boiler #3. A 7,720 mmBtu/hr dry bottom wall fired boiler with fuel oil startup capability.	SVBLR3
Changes to the equipment described in this table are subject to the requirements of R336.1201, except as allowed by R336.1278 to R336.1290.		

The following conditions apply to: EGBOILER2

TABLE E-1.3 EGBOILER2					
EMISSION UNIT/PROCESS GROUP REQUIREMENTS					
EMISSION GROUP		EGBOILER2 Boiler #2. A 3,560 mmBtu/hr cell burner fired boiler with fuel oil startup capability.			
Flexible Grouping ID		FGBOILER12			
I. DESIGN PARAMETERS					
A. Pollution Control Equipment		Two electrostatic precipitators, installed and operated in series, sulfur trioxide flue gas conditioning system, low-NOx burners and SCR.			
B. Stack/Vent Parameters		Exhaust gases shall be discharged unobstructed vertically upwards unless otherwise noted.			
Stack/Vent ID	a. Minimum Height (feet)	b. Maximum Exhaust Dimension (inches)	c. Temperature (°F)	d. Air Flow Rate (acfm)	Applicable Requirement
I. SVBLR12	400	228	NA	NA	R336.1201(3)
C. Other Design Parameters					
NA					
II. MATERIAL USAGE/EMISSION LIMITS					
A. Material		Maximum Usage Rate			
1. Sulfur trioxide flue gas conditioning system		1. 59 pounds sulfur per hour. (R336.1201(3))			
B. Pollutant		Maximum Emission Limit			
2. Particulate Matter		1. 0.15 pound per 1,000 pounds exhaust gas, corrected to 50% excess air. (R336.1331(1)(c))			
III. COMPLIANCE EVALUATION					
Records of all of the following shall be maintained on file for a period of 5 years. (R 336.1201(3))					
A. MONITORING/RECORDKEEPING (R 336.1213(3))					
1. Continuous Emission Monitoring (CEM) System and Recordkeeping		See FGBOILER12 in ROP No. 199600309.			
2. Process Monitoring System and Recordkeeping		1. Sulfur feed rate. (R336.1201(3)) 2. Sulfur burner outlet temperature. (R336.1201(3))			

TABLE E-1.3 EGBOILER2	
EMISSION UNIT/PROCESS GROUP REQUIREMENTS	
3. Other Monitoring and/or Recordkeeping	NA
B. TESTING/RECORDKEEPING (R 336.1201(3))	
1. Parameter to be Tested/Recorded	1. Particulate emissions. (R336.1201(3))
2. Method/Analysis	1. Reference Method 5B - Determination of Nonsulfuric Acid Particulate Matter from Stationary Sources. (R336.1201(3))
3. Frequency and Schedule of Testing/Recordkeeping	1. Every third year or more frequently upon request of the AQD. (R336.1201(3))
IV. REPORTING	
Reports and Schedules	N/A
V. OPERATIONAL PARAMETERS	
1. The flue gas conditioning system shall not be operated unless a minimum hourly average temperature of 700 degrees Fahrenheit is maintained in the sulfur burner outlet. (R336.1201(3))	
VI. OTHER REQUIREMENTS	
1. See FGBOILER12 in ROP No. 199600309.	

The following conditions apply to: EGBOILER3

TABLE E-1.4 EGBOILER3					
EMISSION UNIT/PROCESS GROUP REQUIREMENTS					
EMISSION GROUP		EGBOILER3 Boiler #3. A 7,720 mmBtu/hr dry bottom wall fired boiler with fuel oil startup capability.			
Flexible Grouping ID		NA			
I. DESIGN PARAMETERS					
A. Pollution Control Equipment		Electrostatic precipitator, sulfur trioxide flue gas conditioning system, low-NO _x burners and SCR.			
B. Stack/Vent Parameters		Exhaust gases shall be discharged unobstructed vertically upwards unless otherwise noted.			
Stack/Vent ID	a. Minimum Height (feet)	b. Maximum Exhaust Dimension (inches)	c. Temperature (°F)	d. Air Flow Rate (acfm)	Applicable Requirement
1. SVBLR3	642	327	NA	NA	R336.1201(3)
C. Other Design Parameters					
NA					

TABLE E-1.4 EGBOLLERS

EMISSION UNIT/PROCESS GROUP REQUIREMENTS

II. MATERIAL USAGE/EMISSION LIMITS	
A. Material	Maximum Usage Rate
NA	NA
B. Pollutant	Maximum Emission Limit
1. Opacity	1. 20% per 6-minute period except for one 6-minute period per hour of not more than 27%. (40 CFR Part 60, Subpart D Section 60.42(a)(2))
2. Particulate Matter	1. 0.10 pound per mmBtu heat input. (40 CFR Part 60, Subpart D Section 60.42(a)(1))
3. SO ₂	1. 1.2 pounds per mmBtu heat input, based on a 3-hour average determined in accordance with the performance test established by 40 CFR 60.8. (40 CFR Part 60, Subpart D Section 60.43(a)(2))
4. NO _x	1. 0.70 pound per mmBtu heat input, based on a 3-hour average determined in accordance with the performance test established by 40 CFR 60.8. (40 CFR Part 60, Subpart D Section 60.44(a)(3))
III. COMPLIANCE EVALUATION	
Records of all of the following shall be maintained on file for a period of 5 years. (R 336.1201(3))	
A. MONITORING/RECORDKEEPING (R 336.1201(3))	
1. Continuous Emission Monitoring (CEM) System and Recordkeeping	1. Gas Flow, SO ₂ , CO ₂ , NO _x . See Appendix 1-3.4. Continuous Emission Monitoring (CEM) System (Title IV) in ROP No. 199600309. (40 CFR, Part 75, Appendix B) 2. Opacity. (R336.2101, 40 CFR, Part 60, Appendix B)
2. Process Monitoring System and Recordkeeping	NA
3. Other Monitoring and/or Recordkeeping	1. For each electrostatic precipitator, parameters per Precipitator Operation and Preventative Maintenance Plan. (R336.1910)
B. TESTING/RECORDKEEPING (R 336.1201(3))	
1. Parameter to be Tested/Recorded	1. Particulate emissions. (R336.1201(3))
2. Method/Analysis	1. Reference Method 5B - Determination of Nonsulfuric Acid Particulate Matter from Stationary Sources. (R336.1201(3))
3. Frequency and Schedule of Testing/Recordkeeping	1. Every third year or more frequently upon request of the AQD. (R336.1201(3)) See Appendix 1-5 in ROP No. 199600309.
IV. REPORTING	
Reports and Schedules	1. Quarterly reports of emissions and operating information pursuant to 40 CFR Part 60, Subpart D. Due 30 days following the end of the quarter in which data were collected. (40 CFR, Part 60, Subpart D)
Reports and Schedules (cont'd.)	2. Emission test plans and schedules shall have prior approval of the AQD District Supervisor. A complete report of the test results shall be submitted in accordance with AQD requirements. (Rules 336.2001, 2002, and 2004) See ROP No. 199600309.
V. OPERATIONAL PARAMETERS	
1. Permittee shall not burn freeze conditioning/dust suppression agents or EDTA or citrosolve waste unless the boiler and corresponding electrostatic precipitators are operating properly. (R336.1910)	
2. Permittee shall not burn EDTA and citrosolve waste in more than one boiler at the same time. (R336.1201(3))	
3. Permittee shall combust only EDTA and citrosolve waste from the J.H. Campbell complex. (R336.1201(3))	

TABLE E-14 EGBOLLERS

EMISSION UNIT/PROCESS GROUP REQUIREMENTS


4. Permittee shall not operate a boiler unless all provisions of Rule 330 are met for the corresponding precipitators. (R336.1330)
5. Permittee shall not operate the boilers unless a program describing preventative maintenance (Precipitator Operation and Preventative Maintenance Plan) for each electrostatic precipitator is maintained. (R336.1201(3))
6. Permittee shall not operate the boilers, including startup and shutdown, unless the electrostatic precipitators are installed and operating properly, in accordance with safe operating practices. (R336.1910)

VI. OTHER REQUIREMENTS

1. The permittee shall comply with the acid rain permitting provisions of 40 CFR 72.1 to 72.94 as outlined in a complete Phase II Acid Rain permit issued by the AQD. The Phase II Acid Rain permit is hereby incorporated into this ROP as Appendix 1-9. (R336.1299(d))
2. The permittee shall not allow the emission of an air pollutant to exceed the amount of any emission allowances that an affected source lawfully holds as of the allowance transfer deadline pursuant to R336.1299(d) and 40 CFR Part 72.9(c)(1)(i). (R336.1201(3))

Consumers Energy Memorandum

To: Cobb PTI File

From: RJSavoie, P22-512 

Date: October 31, 2002

Subject: Cobb 4 Generator Replacement

CC:

After a review of the scope of this project, we have determined that replacement of the electric generator on Cobb Unit 4 would not be considered a "modification" under NSPS/NSR regulations and is not subject to the Michigan Permit-to-Install Program. This determination is based on a November 25, 1986 EPA guidance memo (copy attached) titled "Interpretation of Reconstruction." This guidance memo defines the equipment associated with a stationary source that need be accounted for in a "greater than 50% replacement cost analysis." The generator is not included as part of the stationary source in this guidance document and therefore is not an integral part of the emission source.

Michigan Rule 201 states: "A person shall not install, construct, reconstruct, relocate, alter, or modify any process equipment, including control equipment pertaining thereto, **which may emit an air contaminant**, unless a permit to install which authorizes such action is issued by the department." With a electric generator not being considered a part of the stationary source per EPA's definition, it is not considered part of the equipment which may emit an air contaminant.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

2.16

OFFICE OF
AIR AND RADIATION

NOV 25 1986

MEMORANDUM

SUBJECT: Interpretation of Reconstruction (40 CFR 60.15)

FROM: John B. Rasnic, Acting Director *John B. Rasnic*
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: James T. Wilburn, Chief
Air Compliance Branch

This is in response to your September 12, 1986 memorandum requesting the Stationary Source Compliance Division's (SSCD's) opinion of the Florida Electric Power Coordinating Group's (FCG's) interpretation of the reconstruction regulation at 40 CFR 60.15. FCG is proposing specific guidance on the items to be included in the fixed capital cost of fossil-fuel-fired steam electric plants.

Section 60.15 of the New Source Performance Standards (NSPS) specifies that reconstruction occurs if the fixed capital cost of the new components exceeds 50% of the fixed capital cost of a comparable entirely new facility, and if it is technologically and economically feasible for the facility to comply with the applicable NSPS. As cited in FCG's summary, the December 16, 1975 preamble to the reconstruction regulations defines fixed capital cost as the capital needed to provide all the depreciable components, including the costs of engineering, purchase and installation of major process equipment, contractor fees, instrumentation, auxiliary facilities, buildings and structures. Costs associated with the purchase and installation of air pollution control equipment are only included in the fixed capital cost to the extent that the equipment is required as part of the manufacturing/operating process. When determining reconstruction costs, care should be exercised to include only those costs associated with the reconstructed affected facility.

In making the final determination of whether the change in question constitutes reconstruction, the Administrator will consider all technical and economic limitations the facility may have in complying with NSPS. Points to be considered by the Administrator are listed at §60.15(f).

FCG has proposed a list of specific items to be included in the reconstruction costs for fossil-fuel-fired steam electric generating units. The list is composed of the accounting categories provided in the Federal Energy Regulatory Commission 18 CFR Part 101. SSCD and the Emission Standards and Engineering Division have reviewed this list and have determined that a substantial number of the items are not appropriate for inclusion in the cost analysis. Only the costs of items included in, and activities associated with, the affected facility are to be included in the reconstruction costs. The affected facility for fossil-fuel-fired steam electric plants consists only of the steam generating unit as defined at 40 CFR 60.40a and §60.41a. The affected facility is more specifically described at §60.41a in the proposed standards (Attachment A), and in the July 1978 Background Information Document (Attachment B).

Section 60.41a(a) of the proposed standards for electric utility steam generating units elaborates on the definition of steam generating unit: "... A steam generating unit includes the following systems: (1) Fuel combustion system (including bunker, coal pulverizer, crusher, stoker, and fuel burners, as applicable). (2) Combustion air system. (3) Steam generating system (firebox, boiler tubes, etc.). (4) Draft system (excluding the stack)." The affected facility then starts at the coal bunkers, and ends at the stack breeching.

The units which constitute the affected facility may best be conveyed by the diagram in Attachment C. As the diagram indicates, the following items are included in the affected facility: boilers and equipment, breeching, draft equipment, lighting systems, oil-burning equipment, pulverized fuel equipment, stoker or equivalent feeding equipment, and pressure oil systems. The following equipment would only be included in reconstruction costs to the extent that they directly service the boiler: foundations and structural steel, buildings, ash handling equipment (generally only the discharge valves to the ash hopper), boiler feed water system, coal handling and storage equipment (only the coal bunker and pulverizer), instru-

nents and devices, ventilating equipment, wood fuel equipment (wood chipper), circulating pumps (just at the boiler), cooling system, fire extinguishing systems, mechanical meters, platforms, railings, steps, gratings, and steelwork. Likewise, engineering, purchase cost, installation, and contractor fees should be included only to the extent that they are associated with reconstruction of affected process equipment (the steam generating unit).

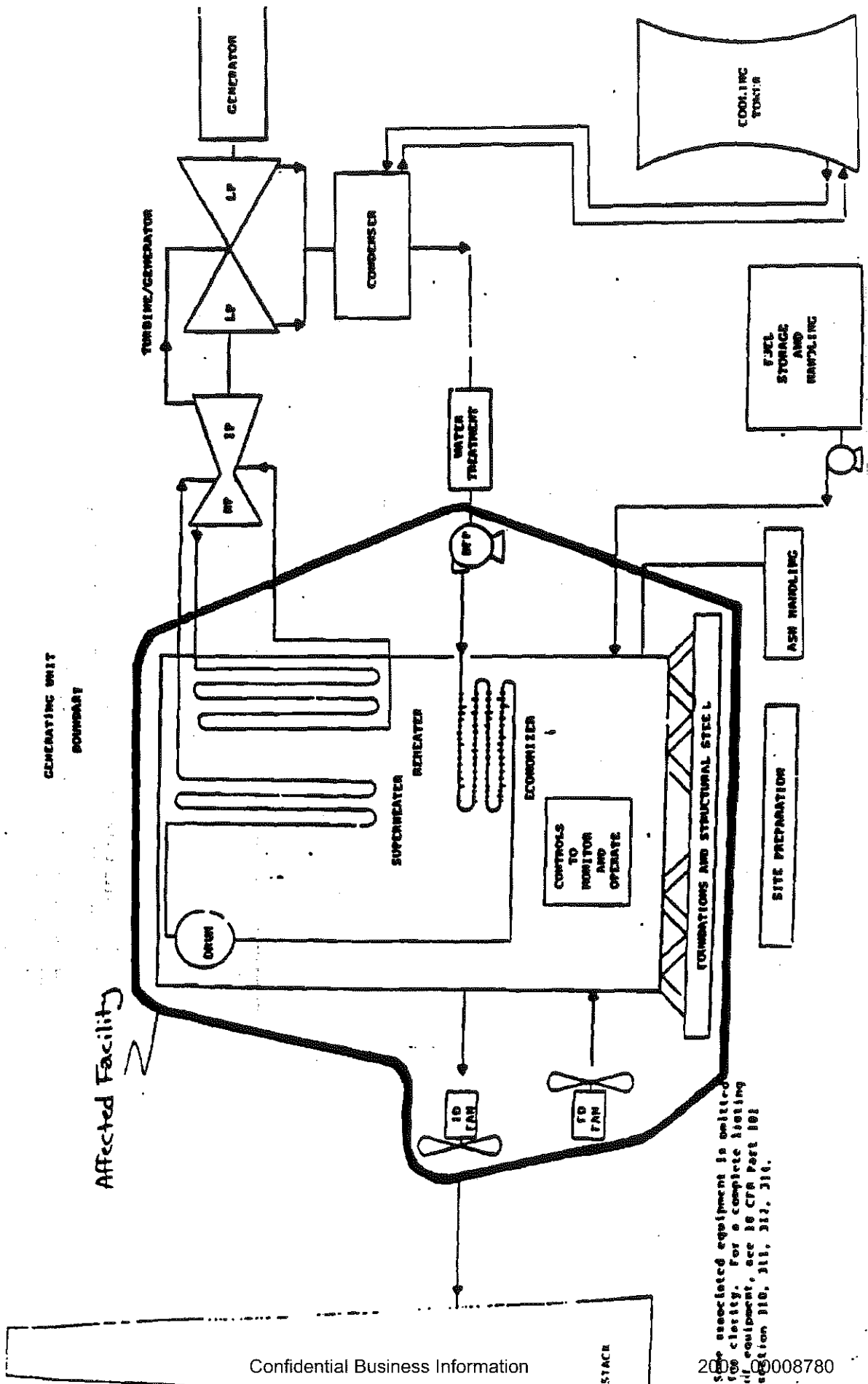
Many of the items included in FCG's proposed list are not part of the affected facility and should not, therefore, be included in reconstruction costs. These items are as follows: land, site preparation, demolition, boiler plant cranes, stacks, station piping, water purification equipment, water-supply systems, air cleaning and cooling apparatus, condensers, generator hydrogen, cranes and hoists, excitation systems identified with the main generating units, foundations and settings for turbogenerator, governors, lubricating systems, main exhaust and main steam piping, throttle and inlet valve, intake and discharge tunnels, turbogenerators, water screens, motors, and moisture separator for turbine steam. Auxiliary boilers should also be excluded from reconstruction cost calculations. SSCD agrees with the Florida Department of Environmental Regulation (DER) that the costs of land and site preparation should not be included in reconstruction costs. Land, site preparation, and demolition are not depreciable components as defined by fixed capital cost. Also, land, unlike process equipment, is not a component of the affected facility that need be or could be replaced.

In conveying our response to the Florida DER, please emphasize that although our evaluation is based on very general information, we recommend determination of reconstruction costs on a case-by-case basis, rather than on the generic basis proposed. If you have any questions, please contact Sally M. Farrell at FTS 382-2875.

Attachments

cc: Jim Manning
Walt Stevenson

Attachment ~
 Modified FFC Diagram Showing Affected Facility for Fossil Fuel Steam Electric Plants



See associated equipment in section 110, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

Frank S Schaner
11/03/03 01:55 PM

To: Nancy A Popa/Pr/Consumers/CMS@CMS, A Kent
Evans/Pr/Consumers/CMS@CMS
cc: Robert C Malec/Bc/Consumers/CMS@CMS, William L
Beckman/Pr/Consumers/CMS@CMS, Richard J
Savio/Pr/Consumers/CMS@CMS
Subject: Cobb Newsletter

Nancy/ Kent,

I got a little nervous when I read your memo, so I thought I would send you the detail for the 2004 Cobb 4 outage budget. It can be broken down many ways, but here is a start:

Total outage budget, both capital, cost of removal, and maintenance is approximately \$42 million. Of this amount, the generator will cost almost \$16 million (I gave Nancy the budget numbers off of the top of my head, including the generator number).

Total Capital: \$36,447,300
Total Maintenance: \$5,848,000

The breakdown by equipment goes something like this:

Boiler retubing and maintenance: \$1,038,000 maintenance + \$12,896,200 capital for a total boiler cost of \$13,934,200

Turbine overhaul with some re-blading work: \$3,995,000 maintenance + \$5,278,000 for a total turbine cost of \$9,273,000

Generator replacement: Almost all capital cost of \$15,805,100

Retubing the condenser: \$1,147,000 capital

Replacement of the coal feeders: \$1,254,000 capital

Balance of plant HEPS, precipitator, motors, cabling, etc. total: \$580,000 maintenance + \$101,000 capital for a total cost of \$681,000

In addition to this, we may replace several feedwater heaters if funds become available for as much as an additional \$2,000,000. Also not reflected are dollars spent to support the plant maintenance crew's work during the outage from the "normal maintenance" budget. This may add approximately another \$500,000.

These estimates are high, but reflect approximately the amount that will be spent on the outage. Taken separately, much of the work has been done before over time on either Cobb 4 or Cobb 5 in the units' past, with the exception of the generator replacement and the feeder replacement. The high total reflects the fact that much work has been deferred until this point in time. If you see something here that puts the unit at risk for New Source Review, please let me know soon. Some of the work has already been committed for, with the boiler and turbine work scheduled to be awarded before the end of 2003. If we are at risk, then scaling of the work can still be performed. Please let me know.

Thanks!

Frank
231-727-6206

----- Forwarded by Frank S Schaner/Bc/Consumers/CMS on 11/03/2003 01:15 PM -----



Robert C Malec
11/03/2003 10:28 AM

To: David S Sandison/Bc/Consumers/CMS@CMS, Frank S
Schaner/Bc/Consumers/CMS@CMS
cc:
Subject: Cobb Newsletter

This is in regards to new source review!!!!

----- Forwarded by Robert C Malec/Bc/Consumers/CMS on 11/03/2003 10:28 AM -----

William L Beckman
11/03/2003 10:22 AM

To: Robert C Malec/Bc/Consumers/CMS@CMS
cc:
Subject: Cobb Newsletter

FYI.

----- Forwarded by William L Beckman/Pr/Consumers/CMS on 11/03/2003 10:21 AM -----

A Kent Evans
11/03/2003 09:57 AM

To: Nancy A Popa/Pr/Consumers/CMS@CMS
cc: Richard J Savoie/Pr/Consumers/CMS@CMS, William L Beckman/Pr/Consumers/CMS@CMS, Ann F Goodman/Mc/Consumers/CMS@CMS
Subject: Cobb Newsletter

Nanc - note the piece on the Cobb 4 generator replacement talks about a total outage expense of \$30 million, which is approaching the 20% EPR criterion. Apparently the \$15 million number you had was only for the generatordo you know if it also included the turbine overhaul? Who did you get your number from? I think we need to take a hard look at this in light of the new EPR to make sure we can document that all of the work is exempt.

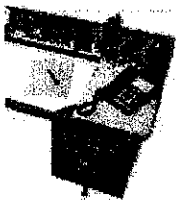
Let's discuss. Ken

----- Forwarded by A Kent Evans/Pr/Consumers/CMS on 11/03/03 09:53 AM -----

William L Beckman
10/31/03 02:27 PM

To: E&LS Staff
cc:
Subject: Cobb Newsletter

----- Forwarded by William L Beckman/Pr/Consumers/CMS on 10/31/2003 02:27 PM -----



Terrie E Caruthers
10/31/2003 02:16 PM

To: James R Coddington/Cm/Consumers/CMS@CMS, William L Beckman/Pr/Consumers/CMS@CMS, Robert A Fenech/Mc/Consumers/CMS@CMS, Scott D Thomas/Mc/Consumers/CMS@CMS, Donald D Hice/Cm/Consumers/CMS@CMS, Calvin H Talley/Kw/Consumers/CMS@CMS, William A Schoenlein/Gr/Consumers/CMS@CMS, James N Todoroff/Kw/Consumers/CMS@CMS, Sandra J Miles/Gr/Consumers/CMS@CMS, Frank A Simon/Ms/Consumers/CMS@CMS, Thomas S Drake/Ms/Consumers/CMS@CMS
cc: Beverly J Woltman/Cm/Consumers/CMS@CMS, Marie Zaski/Mc/Consumers/CMS@CMS, Debra L Gauss/Cm/Consumers/CMS@CMS, Mary L Hishon/Wh/Consumers/CMS@CMS, Marlene F Burnham/Gr/Consumers/CMS@CMS, Marta K Dodd/Mc/Consumers/CMS@CMS
Subject: Cobb Newsletter



OCT-2003.pdf

Glenn P
Fiebelkorn/Bc/Consumers/C
MS

04/05/2006 09:34 AM

To Steven A Ashbay/Bc/Consumers/CMS@CMS

cc

Subject Re: Fw: Project Resumes - B.C. Cobb 4 - No. 4 Low
Pressure Feedwater Heater Replacement, GWO 1580, File
081, B.C. Cobb 4 - Boiler Safety Relief Valve Replacement,
GWO 3016, File 081, & B.C. Cobb 5 - Boiler Safety Relief
Valve Replacement, GWO 2990, File 081 []

just a note of concern/ direction is the fact that the plant is limited on a regular basis based upon steam flow relief capabilities (1154klbs/hour). We would hope to raise this number to something like 1200klbs/hour) so as to not have to worry about this as a control parameter. fyi as a rule of thumb it takes about 7 klbs/hour per mw. Our intent is not to raise the unit ratings but to eliminate derates based upon exceeding steam flow limits. The issue of changing the relief valve capabilities carries some environmental concern (GO Environmental Dept) as it has a potential of raising New Source Emission requirements if an old/high emissions plant like Cobb were to be generating more pollution because of a modification as a result of it generating more megawatts.



Steven A Ashbay/Bc/Consumers/CMS



Steven A
Ashbay/Bc/Consumers/CMS

04/04/2006 07:47 AM

To Glenn P Fiebelkorn/Bc/Consumers/CMS@CMS

cc PO Box: BCC45 3016 U4 BLR SRV@CMS

Subject Re: Fw: Project Resumes - B.C. Cobb 4 - No. 4 Low
Pressure Feedwater Heater Replacement, GWO 1580, File
081, B.C. Cobb 4 - Boiler Safety Relief Valve Replacement,
GWO 3016, File 081, & B.C. Cobb 5 - Boiler Safety Relief
Valve Replacement, GWO 2990, File 081 []

Glen,

We have not been able to dig into the details for the BCC 4- Boiler SRVs yet. I should be able to respond to your question by 4/14.

Thanks,

Steven A. Ashbay
Consumers Energy - ESD
Project Manager
phone: 231.727.6321
cell: 517.206.8280
fax: 231.727.6251

Glenn P Fiebelkorn/Bc/Consumers/CMS

Glenn P
Fiebelkorn/Bc/Consumers/C
MS

To Steven A Ashbay/Bc/Consumers/CMS@CMS

cc

04/03/2006 10:57 AM

Subject Fw: Project Resumes - B.C. Cobb 4 - No. 4 Low Pressure Feedwater Heater Replacement, GWO 1580, File 081, B.C. Cobb 4 - Boiler Safety Relief Valve Replacement, GWO 3016, File 081, & B.C. Cobb 5 - Boiler Safety Relief Valve Replacement, GWO 2990, File 081

Steve, what is the total relieving capacity you are looking at for the new relief valves?



----- Forwarded by Glenn P Fiebelkorn/Bc/Consumers/CMS on 04/03/2006 10:56 AM -----

Robert C
Malec/Bc/Consumers/CMS
04/03/2006 07:16 AM

To David S Sandison/Bc/Consumers/CMS@CMS, Glenn P Fiebelkorn/Bc/Consumers/CMS@CMS
cc

Subject Fw: Project Resumes - B.C. Cobb 4 - No. 4 Low Pressure Feedwater Heater Replacement, GWO 1580, File 081, B.C. Cobb 4 - Boiler Safety Relief Valve Replacement, GWO 3016, File 081, & B.C. Cobb 5 - Boiler Safety Relief Valve Replacement, GWO 2990, File 081

----- Forwarded by Robert C Malec/Bc/Consumers/CMS on 04/03/2006 07:16 AM -----



Steven A
Ashbay/Bc/Consumers/CMS
04/02/2006 07:05 PM

To Mark G Lambert/Bc/Consumers/CMS@CMS, Robert C Malec/Bc/Consumers/CMS@CMS
cc FWH PO Box: BCC45 1580 LP4-4 FWH, Timothy J Burch/Bc/Consumers/CMS@CMS

Subject Project Resumes - B.C. Cobb 4 - No. 4 Low Pressure Feedwater Heater Replacement, GWO 1580, File 081, B.C. Cobb 4 - Boiler Safety Relief Valve Replacement, GWO 3016, File 081, & B.C. Cobb 5 - Boiler Safety Relief Valve Replacement, GWO 2990, File 081

Attached are bimonthly project resumes for the B.C. Cobb 4 - No. 4 Low Pressure Feedwater Heater Replacement, B.C. Cobb 4 - Boiler Safety Relief Valve Replacement and B.C. Cobb 5 - Boiler Safety Relief Valve Replacement projects dated 3/31/06. In the future changes will be indicated in red.

[attachment "BCC4-BLRSRVs-3016-BiMnthlyResume 03-31-06.doc" deleted by Steven A Ashbay/Bc/Consumers/CMS] [attachment "BCC5-BLRSRVs-2990-BiMnthlyResume 03-31-06.doc" deleted by Steven A Ashbay/Bc/Consumers/CMS] [attachment "BCC4-4LPFWH-1580-BiMnthlyResume 03-31-06.doc" deleted by Steven A Ashbay/Bc/Consumers/CMS]

Thanks,

Steven A. Ashbay
Consumers Energy - ESD
Project Manager
phone: 231.727.6321

cell: 517.206.8280
fax: 231.727.6251

Mark C
Babcock/Cm/Consumers/CM
S

04/14/2006 09:17 AM

To Glenn P Fiebelkorn/Bc/Consumers/CMS@CMS
cc Leroy N Reiss/Mc/Consumers/CMS@CMS, Mark G
Lambert/Bc/Consumers/CMS@CMS, Robert T
Gilmore/Mc/Consumers/CMS@CMS, Steven A
Ashbay/Bc/Consumers/CMS@CMS, A Kent
Evans/Pr/Consumers/CMS@CMS

bcc

Subject Re: Fw: Project Resumes - B.C. Cobb 4 - Boiler Safety Relief
Valve Replacement, GWO 3016

If an alteration to increase the steaming capacity of the unit is pursued then we will need to initiate discussions with the State on the level of engineering evaluations required to re-rate the unit. The OEM would most likely be required to complete these, so the project costs will need to be evaluated.

Mark C Babcock, PE
Consumers Energy
phone 616-738-3375
cell 616-836-8099
Fax 616-738-3402
mcbabcock@cmsenergy.com

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Glenn P Fiebelkorn/Bc/Consumers/CMS

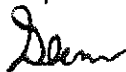
Glenn P
Fiebelkorn/Bc/Consumers/CM
S

04/14/2006 08:52 AM

To Mark C Babcock/Cm/Consumers/CMS@CMS
cc Leroy N Reiss/Mc/Consumers/CMS@CMS, Mark G
Lambert/Bc/Consumers/CMS@CMS, Robert T
Gilmore/Mc/Consumers/CMS@CMS, Steven A
Ashbay/Bc/Consumers/CMS@CMS

Subject Re: Fw: Project Resumes - B.C. Cobb 4 - Boiler Safety Relief
Valve Replacement, GWO 3016

I've spoken with Ken Evans of Environmental already and he indicates that their concern for items like has changed somewhat. He indicated "the landscape has changed alot about these kind of issues" and EPA's "enforcement initiative is declining" in regards to New Source requirements. Anyway, Ken asked that I send him a write up on what the plant's interests and intentions are relating to this matter. He is willing to help us attempt to accomplish what the plant desires without giving any guarantees at this time.



Mark C Babcock/Cm/Consumers/CMS

Mark C
Babcock/Cm/Consumers/CM
S

To Steven A Ashbay/Bc/Consumers/CMS@CMS
cc Glenn P Fiebelkorn/Bc/Consumers/CMS@CMS, Leroy N

04/11/2006 01:25 PM

Reiss/Mc/Consumers/CMS@CMS, Robert T
Gilmore/Mc/Consumers/CMS@CMS, Mark G
Lambert/Bc/Consumers/CMS@CMS
Subject Re: Fw: Project Resumes - B.C. Cobb 4 - Boiler Safety Relief
Valve Replacement, GWO 3016

I would be very careful of any mention of increasing the relieving capacity on the unit. We do not want this project to be considered an alteration. My understanding is that environmental looks at the BTU input for emissions, not the unit MW rating.

The the specification needs to duplicate the existing number of valves and their existing capacity rating.

Mark C Babcock, PE
Consumers Energy
phone 616-738-3375
cell 616-836-8099
Fax 616-738-3402
mcbabcock@cmsenergy.com

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Steven A Ashbay/Bc/Consumers/CMS



Steven A
Ashbay/Bc/Consumers/CMS
04/05/2006 04:11 PM

To Glenn P Fiebelkorn/Bc/Consumers/CMS@CMS
cc Leroy N Reiss/Mc/Consumers/CMS@CMS, Robert T
Gilmore/Mc/Consumers/CMS@CMS, Mark C
Babcock/Cm/Consumers/CMS@CMS, PO Box: BCC45 3016
U4 BLR SRV@CMS
Subject Re: Fw: Project Resumes - B.C. Cobb 4 - Boiler Safety Relief
Valve Replacement, GWO 3016

Sounds we have some details to work out. Thanks for the information.

Thanks,

Steven A. Ashbay
Consumers Energy - ESD
Project Manager
phone: 231.727.6321
cell: 517.206.8280
fax: 231.727.6251

Glenn P Fiebelkorn/Bc/Consumers/CMS

Glenn P
Fiebelkorn/Bc/Consumers/CM
S

04/14/2006 04:01 PM

To A Kent Evans/Pr/Consumers/CMS@CMS

cc

bcc

Subject Cobb 4 and 5 Boiler Relief Valve Replacement

BCCobb has need to replace its boiler relief valves on both units 4 and 5. The Foster Wheeler valves which are currently in service are obsolete and parts and service are no longer available. The relieving capacity of the 11 relief valves on each unit totals 1154klbs/hour. This is sufficient flow to accommodate our units net megawatt ratings most of the time. However, in the summer months the units are derated because of negative efficiency issues like condenser performance with the warmer cooling water temperatures. When the unit efficiency declines the boiler must be fired harder to off set the cycle inefficiencies. Air flow in the summer months has been/can also be a limiting factor in allowing our boilers to have capacity to achieve our current megawatt ratings of 160 mws net each. The Plant has installed new fan rotors and motors, most recently on Unit 4 in 2005, to offset this limitation to our boiler capacity. Modifications to pulverizer mills (new design exhausters fans) is currently in progress on Unit 5 to address boiler limitations with adequate fuel input to achieve full load during wet coal periods.

The point made is the plant has made changes, continues to make changes, to address limitations to its attainment of reaching full load conditions. The Plant has not made effort to change its unit megawatt ratings and has no current plan to do so. Unit ratings are challenged on numerous fronts. Sootblowing to maintain boiler temperature parameters is sometimes a limitation, stack opacity is oftentimes a limitation to achieving full capacity, the main step-up transformer cooling capacity is sometimes a limitation on hot summer days. Turbine backpressure has been a limitation in the summer months. Cobb Unit 4 condenser was retubed in 2005 to address this issue, Cobb 5's condenser continues to be a limiter on occasion. Boiler feedpump, condensate pump capacity is almost fully utilized.

The plant has interest in replacing the relief valves with slightly greater capacity valves to help eliminate derates experienced because of the steam flow limitation. It is my understanding that new valves by other manufacturers may not be available at the exact flow rating of the old valves. The closest valves available may in fact be in alignment with what the plant needs to eliminate this constraint on attaining full load more often.

A point of note/interest is the steam flow limitation can be undermined/addressed, for instance, by cutting out a high pressure heater. The steam that was utilized for heating the feedwater then goes directly to the turbine producing the desired megawatts. The boiler, however, must fire harder to produce the steam flow because the water entering the boiler is possibly 10% cooler. The boiler is being fired harder to meet steam flow limitations with the cycle being less efficient. The net impact is a negative from most all perspectives (efficiency, emissions per mw output) with exception to the megawatt output meeting its rating.

The plant requests your assistance in evaluating any environmental concerns new, higher capacity relief valves may cause.

(I still owe you our Project Scoping documents for these replacement valves.)

SCOPE OF WORK

Campbell 3 Permit Review and Completion Strategy

May 13, 2002

Introduction

Consumers Energy was issued a comprehensive new source review permit (PTI No 287-76B) in late 1999 for a multi-year series of pollution control and efficiency upgrade projects at the J H Campbell Plant, Unit 3. The final phase of the permitted activities results in an increase in steam-generator output coupled with conversion to 100% western coal. Separate NSR permits were issued for selective catalytic reduction NOx control systems on Units 2 and 3, and for substantial modifications to the site's coal yard and fuel handling systems to accommodate the western-coal conversions of Units 1 and 3.

Adjustments to Consumers corporate-wide air-quality compliance strategy have been necessitated by delays and uncertainties in the Federal NOx SIP Call rule and the Federal 126 Petition rule, coupled with Michigan's developing NOx control rules. These adjustments have now placed the completion of the final phase of the Campbell 3 work covered by PTI No 287-76B into the first half of 2005 or the first half of 2006. This Scope-of-Work will review the progress, and proposed extended completion schedules, of the pollution control and efficiency upgrade projects in comparison to the permitted project scope. The primary objective will be to assure that the permit remains valid in light of State and Federal regulations and guidance, and in particular the EPA policies regarding continuous construction and project segmentation. A secondary objective will be to provide documentation of that condition, and to make recommendations on actions that can be taken to strengthen this assurance. Finally, a strategy will be developed to assure that these projects can be completed on the extended schedule(s) with a high level of confidence that the permit will remain valid.

Project Tasks

1. Review all current relevant State and Federal guidance and policies on interruption of continuous construction, project segmentation, and any related issues.
2. Review with appropriate project staff located at the Campbell Complex, all progress completed to date on the Campbell 3 pollution control/efficiency upgrades in comparison to the project scope from the permit application.
3. Review with appropriate project staff located at the Campbell Complex, past schedules and expenditures, and future construction and expenditure schedules for both the '05 and '06 completion options (or for a single option, if a final decision has been made by Consumers).

4. Review emissions data since permit issuance, and projected steam generator and emission control performance following completion, in comparison to the permit application and permit to identify any changes or discrepancies.
5. Analyze the proposed project completion schedule(s) in light of regulatory guidance, and develop any recommendations to strengthen the program for completion under the existing permit.
6. Document findings in a report to Consumers. Include graphical supporting summaries of construction schedules and expenditures that would be suitable for presentation to agency staff in defense of the project objectives.
7. Work with project staff to develop a draft strategy document for assuring that project objectives will be met, including necessary schedule adjustments, potential additional permitting activity, and meeting with agency staff to gain their concurrence with our plan and conclusions.

A K Evans, 5/13/02



BLACK & VEATCH

3550 Green Court
Ann Arbor, Michigan 48105 USA

Black & Veatch Ltd. of Michigan

Tel: (734) 665-1000
Fax: (734) 622-8700

Consumers Energy
Campbell 3 Permit Review and Completion Strategy

B&V Project 831116
May 31, 2002

James P. Pomaranski
Consumers Energy
17000 Croswell
West Olive, MI 49460

Subject: Proposed Scope, Cost, and Schedule

Dear Mr. Pomaranski:

Enclosed for your approval is a work scope, schedule, and estimated budget for the Campbell 3 Permit Review and Completion Strategy assignment. This proposal was requested by Mr. Ken Evans at Consumers Energy. Black & Veatch proposes to do this work under the terms and conditions of the General Services Agreement (GSA) between Black & Veatch Ltd. of Michigan and Consumers Energy Company dated July 16, 1999.

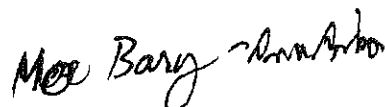
We are proposing a phased approach that encompasses initial review and collection of data, analysis and Presentation of results, report preparation, and draft strategy development. The proposed work scope, schedule, and costs are presented in Enclosure 1. The estimated cost for the work is \$40,800, which includes all labor and expenses. A summary of the budget by phase for this work is also enclosed for your reference. Please note that Mr. Tim Hillman of our Kansas City office will manage and be the Senior Environmental Scientist assigned to this effort.

If you have any questions regarding this proposal, please call me at 734-622-8502 or Tim Hillman at 913-458-7928.

Very truly yours,


BLACK & VEATCH LTD. OF MICHIGAN


Les P. Rinck
Project Director



LPR/bap

Enclosure(s)

 738-3240

Confidential Business Information

2008_00008791

Enclosure 1

Project Approach

Introduction

Black & Veatch (B&V) is pleased to present this proposal to Consumers Energy Company (CEC). The primary objective will be to assure that the air permits remain valid in light of State and Federal regulations and guidance, and in particular the EPA DEQ policies regarding continuous construction and project segmentation. A secondary objective will be to provide documentation of that condition, and to make recommendations on actions that can be taken to strengthen this assurance. Finally, a strategy will be developed to assure that these projects can be completed on the extended schedule(s) with a high level of confidence that the permit will remain valid. B&V proposes to do this work in a phased approach under the terms and conditions of the General Services Agreement (GSA) between Black & Veatch Ltd. of Michigan and Consumers Energy Company dated July 16, 1999.

Background

Consumers Energy was issued a comprehensive new source review permit (PTI No 287-76B) in late 1999 for a multi-year series of pollution control and efficiency upgrade projects at the J H Campbell Plant, Unit 3. The final phase of the permitted activities results in an increase in steam-generator output coupled with conversion to 100% western coal. Separate New Source Review (NSR) permits were issued for selective catalytic reduction NO_x control systems on Units 2 and 3, and for substantial modifications to the site's coal yard and fuel handling systems to accommodate the western-coal conversions of Units 1 and 3.

Nov 106
Adjustments to Consumers corporate-wide air-quality compliance strategy have been necessitated by delays and uncertainties in the Federal NO_x SIP Call rule and the Federal 126 Petition rule, coupled with Michigan's developing NO_x control rules. These adjustments have now placed the completion of the final phase of the Campbell 3 work covered by PTI No 287-76B into the first half of 2005 or the first half of 2006. This Scope of Work will review the progress, and proposed extended completion schedules, of the pollution control and efficiency upgrade projects in comparison to the permitted project scope. *Jan 2 '06*
Nov 3 '06

The following tasks describe B&V's four phase approach to the project. The four phase end points coincide with each of the two site visits (Tasks 3 and 7), the completion of the report (Task 8), and with the final strategy development (Task 9).

Scope

Phase 1 – Initial Review and Collection of Data

Phase 1 consists of Tasks 1 through 3.

Task 1. Project Management.

In this task, the discrete steps needed to complete the project in a timely and efficient manner will be developed by B&V in coordination with CEC. This task also involves resource allocation, planning, and timeline development for the completion of the project.

Task 2. Review of Project Information and Applicable Guidance and Policies.

In this Task B&V will gather and review applicable project information documented from the air permitting of Campbell 3. This will include a review of the permit application(s) and current permit to become familiar with past project assumptions regarding pollution control/efficiency upgrade actions at the plant. B&V will also gather and review relevant State and Federal guidance and policies on interruption of continuous construction, project segmentation, and any related issues. *from B&V*

Task 3. Identify Progress To-Date.

B&V will review with appropriate project staff located at the Campbell Complex, all progress completed to date on the Campbell 3 pollution control/efficiency upgrades in comparison to the project scope from the permit application. So that CEC staff may be prepared and allow for an efficient site visit, B&V will provide CEC prior to the site visit a list of information and data which will be sought during the 2-day site visit. Information to be collected relate to Tasks 3, 4, and 5 as identified below.

Two team members from the B&V Kansas City office will travel to the Campbell Complex to meet with appropriate plant staff to review appropriate files and information and to gather the required data to establish a list of relevant projects completed thus far. This list will be compared to the scope of projects identified in the original and any subsequent permit applications submitted to the Michigan DEQ. The progress to-date as compared to the project scope identified in the applications will be documented.

Phase 2 – Analysis and Presentation of Results

Phase 2 consists of Tasks 4 through 7.

Task 4. Identify Past and Future Expenditure and Schedules.

B&V will review with appropriate project staff located at the Campbell Complex, past schedules and expenditures, and future construction and expenditure schedules for both the 2005 and 2006 completion options (or for a single option, if a final decision has been made by Consumers). Information required for this Task will be obtained during the site visit identified in Task 3, and through subsequent information requests as necessary if applicable data are not available during the site visit. The data collected will be documented and summarized in tabular and graphical form to clearly establish the past and projected future expenditure schedules.

Task 5. Identify Emissions, Steam Generator, and Emission Control Performance.

In this Task B&V will review emissions data since permit issuance, and projected steam generator and emission control performance following completion, in comparison to the permit application and permit to identify any changes or discrepancies. Information required for this Task will be obtained during the site visit identified in Task 3, and through subsequent information requests as necessary if applicable data are not available during the site visit. The data collected will be analyzed and documented in a form to clearly establish a comparison of actuals with projections from the application(s).

Task 6. Make Recommendations.

B&V will analyze the proposed project completion schedule(s) in light of regulatory guidance, and develop any recommendations to strengthen the program for completion under the existing permit.

Task 7. Summarize and Discuss Results.

In this Task B&V will summarize in a presentation the project information collected, analysis results, and draft recommendations. Two B&V team members will travel to and meet for one day with CEC staff to present project results and draft recommendations, to discuss recommendations and future strategy, and establish a report format.

Phase 3 – Report Preparation

Phase 3 consists of Task 8.

Task 8. Prepare Report.

B&V will document project findings in a report to Consumers. The report will include graphical supporting summaries of construction schedules and expenditures that would be suitable for presentation to agency staff in defense of the project objectives. The report will include documentation of information and data obtained from CEC in Tasks 3, 4, and 5 and Task 7 meeting results/recommendations. A draft report will be issued for CEC's review. Following receipt and resolution of comments, a final report will be issued.

Phase 4 – Develop Draft Strategy

Phase 4 consists of Task 9.

Task 9. Assist in Development of Draft Strategy Document.

B&V will work with CEC project staff to develop a draft strategy document for assuring that project objectives will be met, including necessary schedule adjustments, potential additional permitting activity, and meeting with agency staff to gain their concurrence with our plan and conclusions. This will include an assessment of how the scheduled projects fit in with the other pending Title V permit changes for the plant and how the necessary permit modifications can be made in a smooth way. The level of support and effort necessary to prepare the permit modification application package will depend on the results of this Task. As such, permit

application preparation service will be provided as the remaining budget allows, and thereafter on a time and materials basis.

Schedule

B&V is prepared to begin this project immediately upon notification to proceed from CEC. The schedule for completion will depend on availability of data and availability of CEC staff for the site visits. Assuming preliminary information is available and appropriate arrangements can be made, the Task 3 site visit (completion of Phase 1) can be made within 4 weeks of project initiation. This will allow sufficient time for the review of existing information and documentation, preparation of a request for information to be reviewed during the site visit, and for the collection of the requested information by CEC staff prior to the site visit. The completion schedule for remaining Tasks cannot be established at this time as it will depend on the results of the initial Tasks.

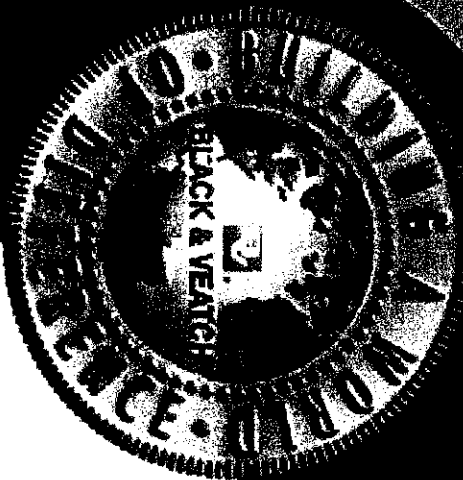
Budget

The estimated cost for all four phases of this work is \$40,800, which includes all labor and expenses. Two trips (Task 3 trip for two-day site visit / Task 7 trip for one-day site visit) with two B&V staff are planned and budgeted for this project. A detailed breakdown of the cost estimate budget by phase is attached.

**Consumers Energy Company Campbell 3 Permit Review
and Upgrade/Fuel Switch Completion Strategy
Budget**

Labor Category	Phase 1 Hours	Phase 2 Hours	Phase 3 Hours	Phase 4 Hours	Total Hours
Sr. Environmental Scientist	40	56	24	24	144
Environmental Scientist	88	112	48	24	272
Project Management	8	4	4	8	24
Subtotal Hours	136	172	76	56	440
Total B&V Labor Revenue	9,397	11,868	5,280	4,166	30,711
Total Expenses	2,603	2,859	538	380	6,380
10 % Contingency	1,200	1,473	582	454	3,709
Total Estimated Cost	13,200	16,200	6,400	5,000	40,800

05/28/02



Consumers Energy

Campbell Unit 3 Project Update and Completion Strategy

Revised 071103 and 100703



building a world of difference™

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Agenda

- Introduction
- Presentation
- Discussions
- Further Actions



Introduction

J.H. Campbell Generating Complex



- Consumers Energy's largest coal-fired generating complex.
- Generating Units
 - Unit 1 – 260 MW (net)
 - Unit 2 – 360 MW (net)
 - Unit 3 – 820 MW (net)
- Pollution Control and Efficiency Enhancements Projects are On-going.



Consumers Energy

 **BLACK & VEATCH**



Background

- Late in 1999, Consumers was issued a comprehensive NSR Air Permit (PTI No. 287-76B) for a multi-year series of pollution control and efficiency upgrade projects at Campbell Unit 3.
- The project encompassed a number of pollution control enhancements and efficiency improvements to the boiler and steam turbine.
- The upgrades authorized under the air permit were scheduled to be completed in several phases beginning in early 2000 and continuing through April 2003.

Consumers Energy

 **BLACK & VEATCH**



Background

- The NOx SIP Call and Section 126 Rule necessitated adjustments to Consumers corporate-wide air compliance strategy.
- Geographic differences between the NOx SIP Call and the Section 126 Rule forced Consumers to focus resources on Selective Catalytic Reduction (SCR) installations at Karn, pushing the final phase of the planned Campbell Unit 3 upgrades into the **first half of 2006**.
- Separate NSR Air Permits have been issued for SCRs on Campbell Units 2 and 3, and for modifications to the coal yard and fuel handling systems to accommodate western coal. The SCRs at Campbell have online schedules of 2006 and 2009 for Units 3 and 2, respectively.

Permit Information



- Consumers prepared an Air Use Permit Application for Unit 3 during the summer of 1999.
- The application requested the installation of LNBs, steam turbine efficiency upgrades, boiler modifications, ESP upgrades, and a switch to 100 percent western coal.
- The application ensured the project would not constitute a modification under NSPS or NSR-PSD by proposing enforceable emission limits.
- Application submitted on September 8, 1999.
- Permit to Install issued on November 15, 1999.

Unit 3 Modifications



- Unit 3 Modifications Requested in the 1999 Application
 - Increase steam turbine efficiency through HP and IP rotor and blade upgrades during routine turbine overhaul beginning January 2000.
 - Increase boiler output to fully load steam turbine HP and IP rotor and blade upgrades.
 - Switch to as much as 100 percent western coal to reduce SO₂ and NO_x emissions.
 - Install LNBS and separated over-fire air system (SOFA) to reduce NO_x emissions to approximately 0.3 lb/MMBtu which will be further reduced to approximately 0.2 lb/MMBtu with the increased use of western coal.
 - Increase ESP efficiency with digital electronic power controls, redesigned rapper plate frame, plate and electrode replacement, and maintenance activities to reduce PM emissions.

Unit 3 Modifications (cont.)



- Unit 3 Modifications Requested in the 1999 Application
 - Upgrade pulverizers.
 - Install higher capacity forced draft (FD) fans and motors.
 - Install higher capacity induced draft (ID) fans and motors.
 - Install higher capacity primary air (PA) fans and motors.
 - Replace boiler division wall.
 - Boiler heat transfer surface modifications.
 - Economizer routine maintenance and replacement.
 - Air heater upgrades.
 - Install additional soot blowers.

Other Related Permits/Projects



- Other Air Permits Linked to the Unit 3 Modifications
 - Campbell Coal Handling Facility Modifications
 - The Coal Handling Facility Modification permit was issued on December 5, 2000.
 - Authorized coal handling equipment improvements, operational changes, and upgrades to accommodate the higher volumes of western coal.
 - Units 2 & 3 SCR Installation
 - Issued May 28, 2002.
 - Authorized the SCR for Units 2 & 3 as pollution control projects.

Coal Handling Facility Modifications



- Coal Handling Facility Modifications Requested in the 2000 Application
 - Upgrades to modify the fuel handling operational characteristics of receiving, storing, and re-supplying solid fuel to the generating units.
 - Upgrades to Unit 3's dumper, dumper positioner, railroad track layout, and fuel handling systems controls to accommodate western coal and allow the conveyance of up to 30 percent (depending on railcar delivery schedule) of the western coal directly to the plant boilers to reduce stack-out and reclaim.
 - Upgrades to the dust collection systems to compensate for increased coal handling capacity and western coal dusting loads at the transfer points. Major upgrades to the dust collection system include a pneumatic transfer system of collected coal dust to the unit storage bunkers, and new larger, high efficiency dust collector fabric filters and associated dust return systems designed to handle the increased airflow requirements.

Coal Handling Facility Modifications (cont.)



- Coal Handling Facility Modifications Requested in the 2000 Application
 - Relocate the western coal pile to the eastern side of the stacker/reclaimer.
 - Establish an inactive pile of western coal along the southern edge of the western coal pile.
 - Upgrade coal yard sprinkler systems.
 - Upgrade housekeeping vacuum systems.

Permit Compliance



- Continuous Construction and Project Segmentation
 - With the third and final phase of Unit 3 modifications delayed until 2006, Consumers reviewed the continuous construction requirements of the permit and applicable regulations to ensure compliance.
- WEPCO Rule Compliance
 - Special air permitting rules for electric utility steam generating units prompted by the WEPCO litigation, requiring post-project emissions tracking and reporting.

2008_00008808

Confidential Business Information

Continuous Construction



- Continuous Construction Regulations
 - General Condition 2 of Unit 3's permit states... "If the installation, reconstruction, relocation, or alteration of the equipment for which this permit has been approved has not commenced within 18 months, or **has been interrupted for 18 months**, this permit shall become void unless otherwise authorized by the Department"
 - This permit condition stems from MDEQ Air Pollution Control R336.1201, Rule 201(4), which further defines "commenced" construction as undertaking a **continuous program of on-site** fabrication, installation, erection, or modification, or having entered into binding agreements or contractual obligations which cannot be canceled or modified without substantial loss to the owner, to undertake a program of construction to be completed within a reasonable time.

Continuous Construction



- USEPA guidance assumes that construction is not interrupted if it can be demonstrated that:
 - *There exists a continuous program of physical **on-site construction***
 - *There is a **contractual obligation** to undertake a program of on-site construction*
 - *Construction is **scheduled** to be completed within a reasonable time*

On-Site Construction



- What constitutes physical on-site construction?
- According to the USEPA:
 - *The **placement, assembly, or installation of materials, equipment, or facilities** that make up part of the ultimate structure of the modification.*
 - *Must take place on-site or be site specific.*
 - *The placement of footings, pilings, and other materials needed to support the ultimate structure clearly constitutes on-site construction.*

Contractual Obligation



- What constitutes a contractual obligation to undertake a program of construction?
- According to the USEPA:
 - Site specific **contractual commitment to activities** including the placement, assembly, or installation of materials, equipment, or facilities that make up part of the ultimate modification.
 - Contracts for footings, pilings, and other site specific materials and equipment clearly satisfy the requirement.
 - Contractual commitment must be one that cannot be cancelled or modified without substantial loss (clearly substantial loss if > than 10 percent of total project cost, losses < than 10 percent considered substantial on a case by case basis).



Schedule

- What constitutes a reasonable time to complete construction?
- According to the USEPA:
 - *Construction proceeds in a continuous manner if there is not a break in construction of greater than 18 months.*
 - *The 18 month period may be extended upon satisfactory demonstration that an extension is justified.*

Continuous Construction Compliance

	2000	2001	2002	2003	2004	2005	2006	2007	2008
<p>Unit 3 Project:</p> <ul style="list-style-type: none"> Consumers has reviewed Unit 3's construction schedule as well as the financial/contractual commitments and believe they are consistent with the intent of the aforementioned guidance and therefore do not constitute an interruption of construction. 	JHC #2 ACTUALS: 8/30/00 - 12/28/00 (99 days)								
	BGC #5 ACTUALS: 11/28/00 - 3/4/01 (108 days)								
	JHC #1 ACTUALS: 1/28/01 - 6/6/01 (128 days)								
	DEK #2 SCR FOUNDATION ACTUALS: 7/1/01 - 4/15/02								
	DEK #1 SCR FOUNDATION ACTUALS: 7/1/01 - 4/15/02								
	JHC #3 ACTUALS: 2/24/02 - 5/20/02 (71 days)								
	JHC #2 SCR FOUNDATION ACTUALS: 4/1/02 - 12/31/02								
	DEK #2 SCR CONSTR ACTUALS: 4/15/02 - 1/1/03								
	DEK #1 SCR CONSTRUCTION 5/4/02 - 5/28/03								
	DEK #2 "Tie-in" 1/11/03 - 3/28/03 (77 days)								
	JHC #3 SCR FOUNDATIONS 2/28/03 - 4/8/04								
	DEK #1 SCR PRE-OUTAGE 8/21/03 - 1/28/04								
	DEK #1 "Tie-in" 1/1/04 - 4/28/04 (98 days)								
	JHC #3 SCR CONSTRUCTION 11/6/04 - 11/1/05								
	JHC #3 BLR TOP STEEL 6/24/05 - 11/28/05								
	JHC #3 "Tie-in" 1/20/06 - 5/22/06 (140 days)								
	JHC #2 SCR CONSTRUCTION 4/21/06 - 12/31/06								
	JHC #2 "Tie-in" 4/20/06 - 1/20/07 (28 days)								

Data Date
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TITLE 1 PROJECT
NOX IMPLEMENTATION STRATEGY
"OPTIMIZED PLAN"

Consumers Energy

**Campbell Unit 3 Pollution Control and Efficiency Enhancement
Project-To-Date Comparison with Permit Approved Modifications**

Campbell Unit 2 & 3 SCR Installation Project-To-Date Comparison with Permit Approved Modifications										
First Phase Outage			Second Phase Outage			Third Phase Outage				
2000			2001			2002			2003	
Outages: 7 Jan - 19 Mar						Outages: 23 Feb - 5 May				
			Campbell Unit 2 SCR Construction			Unit 3 SCR Engineering Unit 3 SCR Foundation				
						Interferometers, Birmingham Plant, and Unit 3 SCR Construction New Addition, including piping and electrical work, and Reactors.			Campbell Unit 3 SCR Structural Steel Millwork	
									*Tie In Unit 3 SCR	
									Outages: Jan - May	
Revised 07/11/03 & 10/07/03										

Campbell Coal Handling Facility Upgrade Project-To-Date Comparison with Permit Approved Modifications									
	First Phase Outage		Second Phase Outage						Third Phase Outage
	2000	2001							2005
	Outage: 7 Jan - 11 Mar		Outage: 23 Feb - 5 May						Outage: Jan - May
	*Unit 3 Dumper Upgrades. *Modify Railroad Track Layout. *318 Tipper Replacement. *Modify Dumper Positioner.	*Modify Dumper Track Layout.	*Coal Feeder(s) Upgrade. *Install Fuel Handling DCS.						
	*Dust Collector Replacements.	*Dust Collector Replacements.	*Train Unit 3 new Unit 3 Dust Collectors.						
		*Western Coal Pile Moved to East Side of S.R.							*Establish an Inactive Pile of Western Coal Along the Southern Edge of the Storage Pile.
			*Coal Yard Sprinkler System Upgrade						
		*Housekeeping Vacuum System Upgrades.							
	</								



Project-To-Date Expenditures

To-Date Project Expenditure and Schedules				
	2000	2001	2002	Total
Unit 3 Modification Permit				
Steam Turbine Upgrade	\$1.0	-	-	\$1.0
Boiler Feed Booster and Feed Pump Turbine Upgrades	-	-	-	-
Distributed Control System (DCS) and Neural Net Installation	\$0.3	\$9.1	\$4.5	\$13.9
Boiler Modifications*	\$3.5	\$42.4	\$4.6	\$50.5
Electrostatic Precipitator Maintenance	\$3.4	\$0.1	\$4.0	\$7.5
Coal Pulverizer Upgrades	\$1.0	\$13.5	\$0.8	\$15.3
Project Management/Engineering Oversight**	\$2.6	\$11.2	\$6.2	\$20.0
Sub-Total	\$11.8	\$76.3	\$20.1	\$108.2
Unit 3 SCR Permit				
SCR System and Ancillary Equipment	-	\$2.9	\$4.4	\$7.3
Coal Handling Facility Upgrade Permit				
Unit 1 Coal Bunker Modifications	-	\$2.3	-	\$2.3
Unit 3 Coal Bunker and Feeder Modifications	-	\$0.023	-	\$0.023
Unit 3 Dumpster Upgrade	\$2.8	\$0.14	-	\$2.9
Fuel Handling DCS Installation	\$0.7	\$4.7	\$2.7	\$8.1
Modify Railroad Tack Layout	\$0.8	\$3.2	-	\$4.0
Dust Collector Replacements	\$4.0	\$13.1	-	\$17.1
Coal Yard Sprinkler System Upgrade	-	\$0.015	\$0.17	\$0.19
31B Tripper Replacement	\$1.2	-	-	\$1.2
Sub-Total	\$9.5	\$23.5	\$2.9	\$35.8

*Includes: Bottom Ash Clinker Grinder Replacement, Installation of LNBs and Separated Over-Fire Air System (SOFA) Modifications, Primary Air (PA) Fan Replacement, and Water Cannon(s) Installation.
 **Includes: Consumers Title I Project Management Team costs and services.
 (All figures in millions of dollars, based on Jan 13, 2003 revised costs)

Consumers Energy

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Future Project Expenditures

Future Project Expenditure and Schedules						
	2003	2004	2005	2006	Total	
Unit 3 Modification Permit						
Steam Turbine Upgrade	-	-	-	-	-	
Boiler Feed Booster and Feed Pump Turbine Upgrades	-	-	\$0.6	\$2.5	\$3.1	
Distributed Control System (DCS) and Neural Net Installation			\$0.2	\$1.5	\$1.7	
Boiler Modifications*	\$1.3	\$4.2	\$10.9	\$71.1	\$87.5	
Electrostatic Precipitator Maintenance	-	-	-	-	-	
Coal Pulverizer Upgrades	-	\$1.4	-	\$0.4	\$1.8	
Project Management/Engineering Oversight**	\$2.7	\$3.3	\$3.9	\$15.1	\$25.0	
Sub-Total	\$4.0	\$8.9	\$15.6	\$90.6	\$119.1	
Unit 3 SCR Permit						
SCR System and Ancillary Equipment	\$8.5	\$39.0	\$62.2	\$13.1	\$122.8	
Coal Handling Facility Upgrade Permit						
Unit 3 Coal Bunker and Feeder Modifications	-	-	\$2.5	\$5.5	\$8.0	
Sub-Total	-	-	\$2.5	\$5.5	\$8.0	
*Includes: Bottom Ash Clinker Grinder Replacement, Installation of LNBs and Separated Over-Fire Air System (SOFa) Modifications, Primary Air (PA) Fan Replacement, and Water Cannon(s) Installation.						
**Includes: Consumers Title I Project Management Team costs and services.						
(Millions of dollars)						

*Includes: Bottom Ash Clinker Grinder Replacement, Installation of LNBs and Separated Over-Fire Air System (SOFA) Modifications, Primary Air (P/A) Fan Replacement, and Water Cannon(s) Installation.
 **Includes: Consumers Title I Project Management Team costs and services.
 (Millions of dollars)

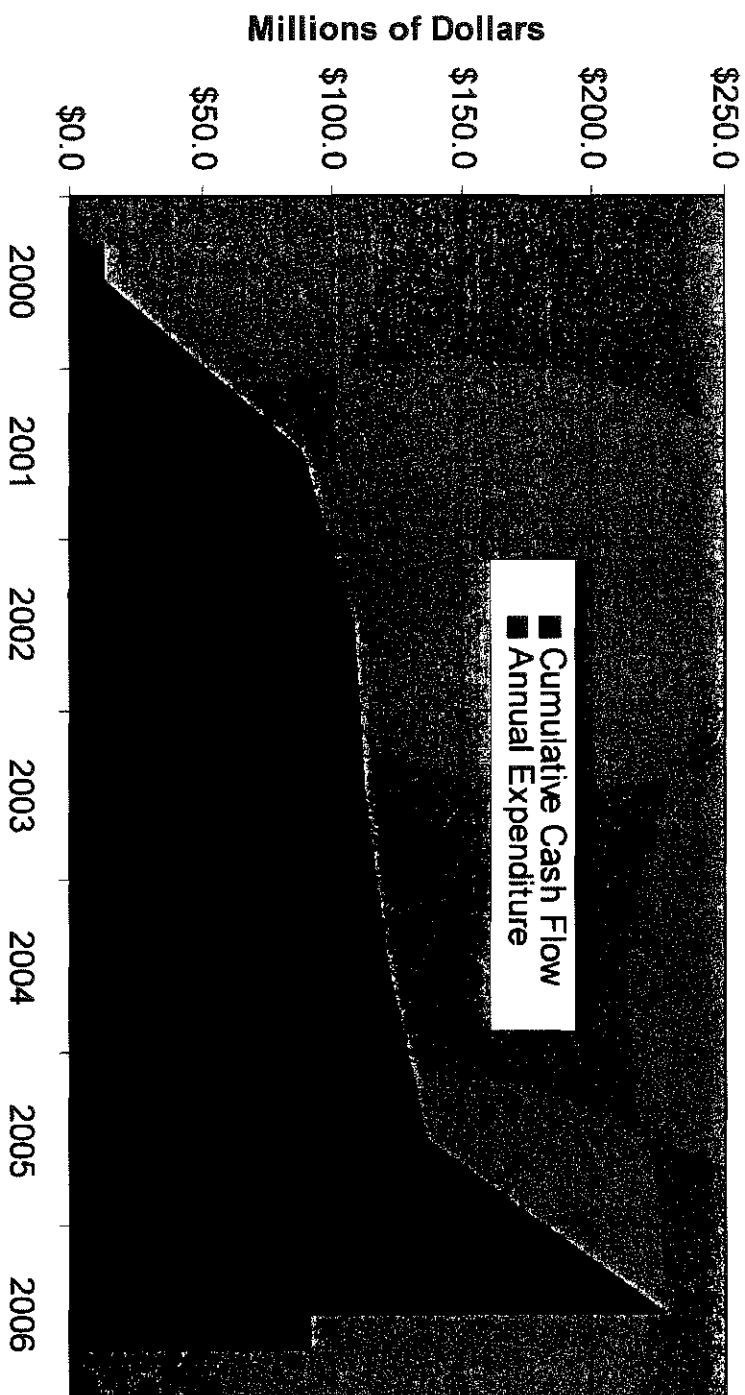


Revised 07/11/03 and 10/07/03

BLACK & VEATCH



Cash Flow Unit 3 Pollution Control & Efficiency Enhancement Project



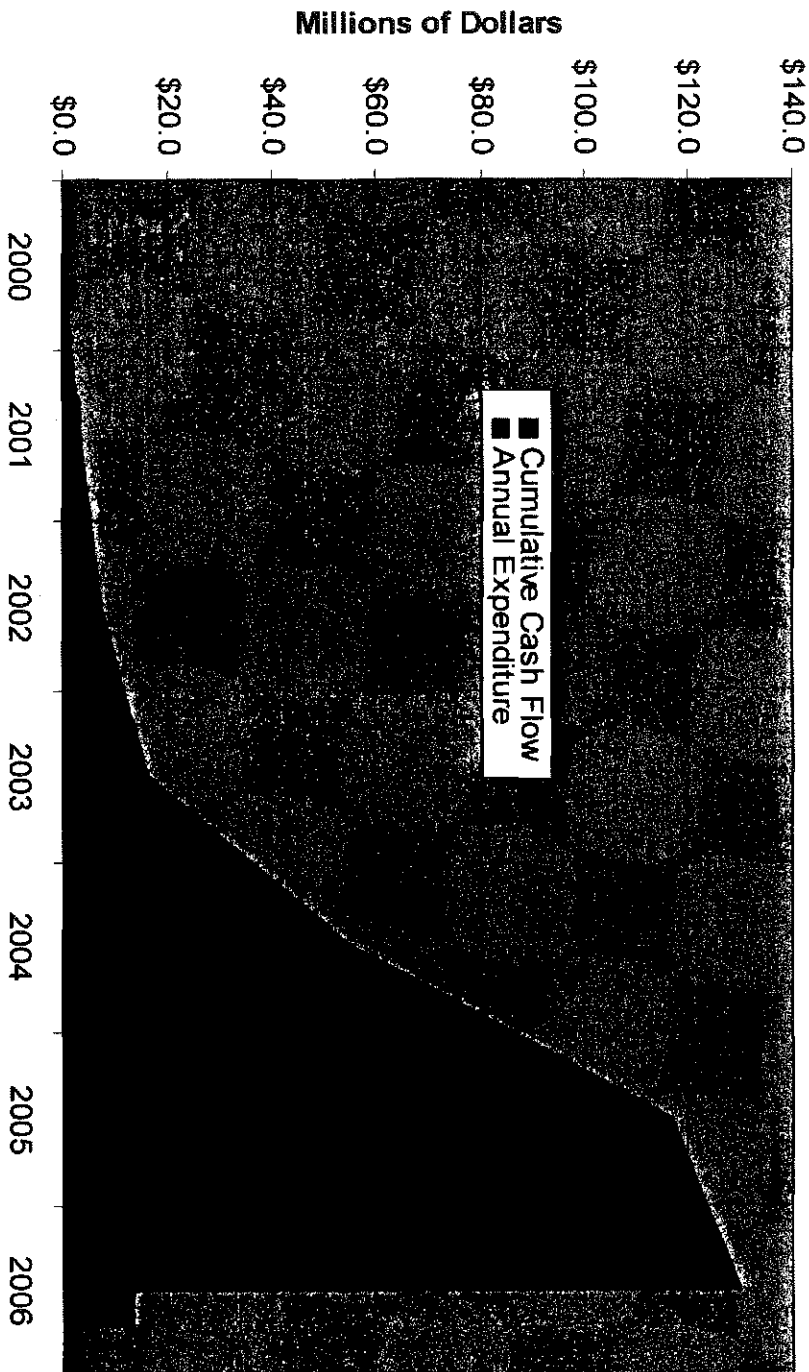
Consumers Energy

Revised 071103 and 100703

BLACK & VEATCH



Cash Flow Unit 3 SCR Project



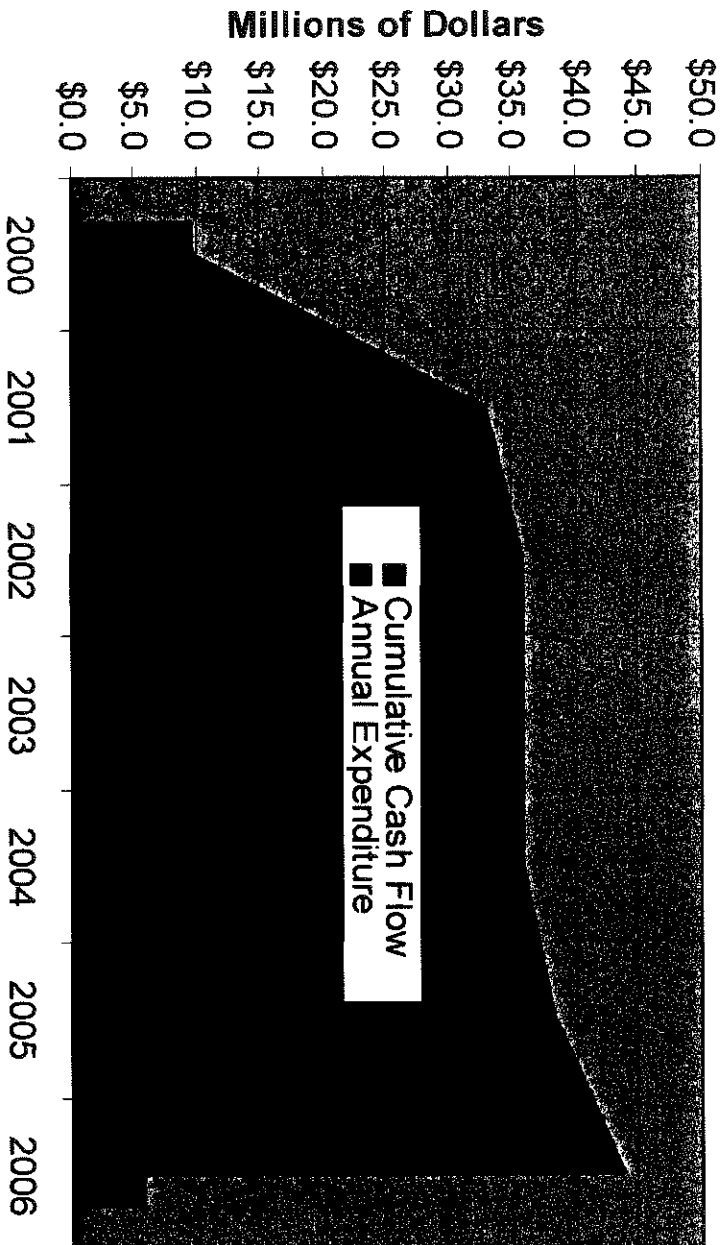
Consumers Energy

Revised 100703

BLACK & VEATCH



Cash Flow Campbell Coal Handling Complex Permit



Consumers Energy

Revised 071103 and 100703

BLACK & VEATCH

New Source Review Compliance



● WEPCO Rule

- In 1992, the USEPA promulgated revisions to NSR-PSD applicability regulations prompted by the WEPCO litigation and commonly referred to as the "WEPCO Rule". The rule allows non-routine modifications that could affect emissions at an electric utility steam generating unit (**EUSGU**) to use an "actual-to-future-actual" methodology for determining **NSR-PSD applicability**.

- Revised NSR Regulations [FR December 31, 2002] were promulgated on March 3, 2003. In general, the revised rules allow all existing units (EUSGU and non-EUSGUs alike) to use an "actual-to-projected-actual" applicability test for **NSR-PSD**. Much of the WEPCO Rule provisions for EUSGUs remain intact in the revised rules, although some changes have been made.



WEPCO Rule

- WEPCO Rule Provisions
 - Allows past-actual-to-future-**actual** emission calculation methodology (drawn from utilization projections available in the record) for determining NSR-PSD applicability vs. past actual-to-future-**potential**.
 - Submit to the permitting agency on an annual basis for a period of at least 5 years (or a period not to exceed 10 years if more representative of post-change operation) from the date the unit resumes regular operation, information demonstrating no significant emission increase.

WEPCO Rule – Changes Under Revised NSR-PSD Regulations



- **Baseline Actual Emissions (*Actual Emissions*)**
 - **WEPCO Rule:** Average ton-per-year emissions for the **2-year period** proceeding the modification.
 - **Revised NSR-PSD:** Average ton-per-year emissions for any **consecutive 24-month period** within the 5-year period immediately proceeding the modification, including downward adjustments for any current, legally enforceable emission limits.
- **Unit 3 Project:**
 - **Baseline Actual Emissions** were based on the average annual emission rate for the 1997 and 1998 2-year period.

WEPCO Rule – Changes Under Revised NSR-PSD Regulations



- Projected Actual Emissions (*Representative Actual*)
 - **WEPCO Rule:** Average ton-per-year emissions for the **2-year period after the modification**, or another 2-year period within 10 years at the request of the Administrator.
 - **Revised NSR-PSD:** **Maximum annual ton-per-year emissions in any 1 of the 5 years (12 month period) following the modification.**
- Unit 3 Project:
 - Projected Actual Emissions for Unit 3 were based on the average annual emission rate for the 2-year period after the modification, April 2003 through April 2005.

WEPCO Rule – Changes Under Revised NSR-PSD Regulations



- Tracking and Reporting Post-Change Emissions
 - **WEPCO Rule: Annual basis for a period of 5 years, or up to 10 years at the request of the Administrator.**
 - **Revised NSR-PSD: Annual emissions in a ton-per-year calendar basis for 5 years following a return to regular operation, or for 10 years if modification project increases design capacity or potential to emit.**

Unit 3 Project:

- Consumers has been complying with the post-change emissions tracking and reporting provisions since 2001.
- Tracked actual emission are less than the projected actual emission.
- Consumers will continue the post-change emissions tracking and reporting for the 5-year period following the completion of the final phase of the Unit 3 upgrades [or 10 years under the new NSR rules].



Summary

- The 1999 Campbell Unit 3 permit encompassed a comprehensive 3-year series of pollution control and efficiency upgrade projects combined in a single permit to avoid the appearance of segmentation.
- The construction schedule was impacted by developments under the NOx transport rulemaking, which resulted in schedule adjustments and an additional permit for SCR installations.
- Although construction is expanded to over 5 years, the continuous project progress and committed cash flow clearly meets the criteria for continuous construction, and the permit should remain valid.

Executive Summary

Consumers retained Black & Veatch to review and study a series of air construction permits associated with several pollution control and efficiency upgrade projects at the J. H. Campbell Generating Complex with a purpose to evaluate their status with respect to continuous construction and project segmentation regulatory policies. The study consisted of the following components:

- Review of Project Information and Applicable Guidance and Policies
- Identification of Project Progress To-Date
- Identification of Past and Future Expenditures and Schedules
- Strategy Development
- Staff Agency Presentation
- Findings and Recommendations Report

The review included the original Air Use Permit application packages and the Permit to Install air construction permits for the Unit 3 Modification, Unit 3 SCR, and the Coal Handling Facility Upgrade permit-authorized projects. Black & Veatch also gathered and reviewed relevant state and federal regulatory guidance and policies related to interruption of continuous construction, project segmentation, and the NSR WEPCO Rule.

Progress to-date schedule tables were prepared to illustrate the extensive nature and scope of the permit-authorized projects, and to document Consumers' completion progress with respect to continuous construction and project segmentation policy and guidance criteria. Cash flow data, coincident with the progress to-date schedules, representing current and future expenditures associated with the permit-authorized projects were compiled as additional evidence of Consumers' commitment towards project completion.

While the permit-authorized upgrades and modifications have indeed exceeded the expressed and implied schedules contained in the original Air Use Permit application packages and final Permit to Install air permits, this study finds evidence of Consumers' clear intent and actions to undertake a program of continuous construction to be completed within a reasonable time. To that end, several recommendations related to continuous construction and project segmentation policy criteria, as well as specific recommendations encompassing the WEPCO Rule emissions reporting requirements are presented in this report to enhance that position and minimize the risk of permit avoidance.

5.0 Conclusions and Recommendations

The following sections summarize the findings and conclusions of this review and offer some specific recommendations to manage the potential risks associated with continuous construction, project segmentation, and WEPCO Rule emissions reporting requirements.

5.1 Conclusions

It is evident from the data gathered and summarized in this report, that the scheduled completion dates of the permit-authorized upgrades and modifications planned for Unit 3 have indeed exceeded the expressed and implied schedules contained in the Air Use Permit application package and final Permit to Install air construction permit. The stated objective of this report was to assemble reasonable documentation and project information in order to evaluate the risk of these permits becoming void or subject to additional review under continuous construction and project segmentation rules. The circumstances of this review and evaluation have by their very nature necessitated a focus on project construction and completion schedules, as well as the financial and contractual commitments surrounding the completion of the permit-authorized projects. In consideration of this information, Consumers' intent to undertake a program of continuous construction is evident; and as summarized below, should not reasonably be considered to constitute an interruption of construction or project segmentation.

- Consumers' current and forecasted project schedules of permit-authorized modifications and upgrades demonstrate a continuous progression of project related construction activities and related events, with no apparent intent of permanent or unreasonable interruption of progress. These project activities include the placement, fabrication, assembly, and installation of materials and equipment that make up all or part of the entire project, which are essentially unbroken from the initial start of

construction through the final 2006 outage. Based on the guidance reviewed and referenced herein, the USEPA has interpreted these activities as evidence of a continuous program of physical on-site construction.

- Also apparent from these data, is Consumers' financial commitment to the completion of the permit-authorized upgrades and modifications through the 2006 outage. The nearly \$250 million earmarked for the Unit 3 Modification, Coal Handling Facility Upgrade, and Unit 3 SCR permits in the form of contracts, equipment and materials purchase, and labor costs is consistent with USEPA's second litmus of contractual obligation with respect to continuous construction criteria.

A summary level presentation of these findings and conclusions was made by Consumers and Black & Veatch to MDEQ's Air Quality Division District Supervisor on June 18, 2003 in their Grand Rapids, MI office. The purpose of the MDEQ meeting actually fulfilled one of the initial recommendations of this study, which was to document and communicate to the permitting authority Consumers' ongoing commitment to undertake a program of on-site construction that will be completed within a reasonable time. The presentation and explanation of the project to-date schedule tables and cash flow data were well received and understood by the MDEQ, and no apparent concerns regarding continuous construction or project segmentation were either expressed or implied. At MDEQ's request, Consumers agreed to provide a project update following the 2006 outage, as the planned construction activities draw to a close, or sooner if substantial changes in schedule warrant. A copy of the summary presentation to the MDEQ, entitled Campbell Unit 3 Project Update and Completion Strategy, is included with this report as Appendix H.

5.2 Recommendations

In order to support the argument that construction has not been interrupted, Consumers will need to continue to satisfy the "commenced construction" criteria (*begin a continuous program of*

physical on-site construction, or enter into a contractual obligation to undertake a program of on-site construction to be completed within a reasonable time) through the 2006 scheduled outage. To this end, the following recommendations are made:

- Provide updated schedule tables, cash flow data, and evidence of contractual obligation to the MDEQ prior to the third phase construction outage.
- Provide a final project update following the completion of construction activities in 2006.
- Formally request in writing extensions to the implied/expressed Permit to Install expiration dates. (For example, the estimated completion date for the Unit 3 Modification Permit is April 2003.)
- Consider requesting formal MDEQ authorization for an extension of the 18 month construction interruption period under General Condition 2 of the Unit 3 Modification Permit to Install, particularly in the event of additional schedule delays.

Consumers should continue to provide the Representative Actual Annual Emission Reports to the MDEQ for at least 5 years following the completion of the final phase construction outage. To date, these reports clearly demonstrate that Unit 3's emissions are within the limits established in the Permit to Install. The following additional recommendations are made with respect to the WEPCO Rule.

- Consumers should begin estimating future actual annual emissions to verify that they can meet the actual emission limits of the Unit 3 Modification Permit (originally based on the projections of the project emissions increase and the electrical demand increase for the period 2003 to 2005) for the period immediately following the 2006 completion schedule and beyond.

- Consumers should consider revising their Representative Actual Annual Emission Reports to conform with the December 31, 2002, NSR/PSD revisions. The new rules require that a modification to an electric utility steam generating unit, which results in an increase in the unit's design capacity, report its actual emissions to the reviewing authority within 60 days after the end of the calendar year for a period of 10 calendar years following the time the unit returns to normal operation.

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Consumers Energy

Campbell Facility Project Update and Completion Strategy



ENERGY • WATER • INFORMATION • GOVERNMENT

November 2005



Agenda

- Introduction
- Presentation
- Discussions and Questions
- Further Actions



J.H. Campbell Generating Complex

- Consumers Energy's largest coal-fired generating complex.
- Generating Units
 - Unit 1 – 260 MW (net)
 - Unit 2 – 360 MW (net)
 - Unit 3 – 820 MW (net)
- Several Pollution Control and Efficiency Enhancements Projects are On-going.



Background

- In Late 1999, Consumers Was Issued a NSR Air Permit (PTI No. 287-76B) for a Multi-Year/Phase Series of Emission Control Enhancements and Efficiency Improvements to the Unit 3 Boiler and Steam Turbine
- The Permitted Upgrades Were Scheduled to be Completed in Phases Beginning in Early 2000 and Continuing Through April 2003

Background

- The NOx Transport Rulemakings (SIP Call Rules & 126 Petition Rules) Required Adjustments to Consumers Corporate-Wide Air Compliance Strategy
- Consumers Focused Resources on SCR Installations at Karn, Delaying the Final Phase of Unit 3 Upgrades into 2006
- NSR Air Permits Were Issued for SCRs on Units 2 and 3, and for Modifications to the Fuel Handling Systems to Accommodate Western Coal.



- Consumers Outlined the Status and Completion Strategy of Several Permit to Install Projects in a June 18, 2003 Meeting with MDEQ-AQD District Supervisor (1st Update)
- Continuous Construction Rule Implications were Reviewed
- Consumers Agreed to Additional Project Updates Following the 2006 Outage or Sooner if Schedule Impacts Warranted

Permit Compliance

- Continuous Construction and Project Segmentation
- Consumers has reviewed the continuous construction requirements of the permit and applicable regulations to ensure compliance
- WEPCO Rule Compliance
 - Special air permitting rules for electric utility steam generating units prompted by the WEPCO litigation (and subsequently by NSR Reform), require post-project emissions tracking and reporting



Continuous Construction

- PTI General Condition... "If the installation, reconstruction, relocation, or alteration of the equipment for which this permit has been approved has not commenced within 18 months, or **has been interrupted for 18 months**, this permit shall become void unless otherwise authorized by the Department"
- MDEQ Air Pollution Control R336.1201, Rule 201(4), which further defines "commenced" construction as undertaking a **continuous program of on-site** fabrication, installation, erection, or modification, or having entered into binding agreements or contractual obligations which cannot be canceled or modified without substantial loss to the owner, to undertake a program of construction to be completed within a reasonable time.

Permit Status Summary

Permit to Install:

Unit 3 Pollution Control & Efficiency Enhancement Project

• Authorized Projects

- LNBS
- Steam Turbine Upgrade
- Boiler Upgrade
- ESP Upgrade
- Switch to 100% Western Coal

• Schedule

- Submitted Sep 99
- PTI Issued Nov 99
- Completion Apr 03
- Completion (1st Update) May 06
- Completion (Current) Apr 07



Project To-Date Expenditures

Permit to Install:

Unit 3 Pollution Control & Efficiency Enhancement Project

Unit 3 Pollution Control & Efficiency Enhancement Permit to Install of November 1999	2000	2001	2002	2003	2004	2005	Total (00-05)
Steam Turbine Upgrade	\$1.0						\$1.0
Boiler Feed Booster & Feed Pump Turbine Upgrades	\$0.3	\$9.1	\$4.5				\$13.9
Distributed Control System & Neural Network Installation	\$3.4	\$0.1	\$4.0				\$7.5
Electrostatic Precipitator Maintenance	\$1.0	\$13.5	\$0.8		\$1.4	\$0.5	\$17.2
Coal Pulverizer, Feeder & Bunker Upgrades					\$0.5	\$5.2	\$5.7
Fuel Management Optimization	\$3.5	\$42.4	\$4.6	\$1.3	\$4.2	\$8.7	\$64.7
Boiler Upgrade	\$2.6	\$11.2	\$6.2	\$2.7	\$3.3	\$3.3	\$29.3
Project Management & Engineering Oversight							
Project Sub-Total	\$11.8	\$76.3	\$20.1	\$4.0	\$9.4	\$17.7	\$139.3



Future Expenditures

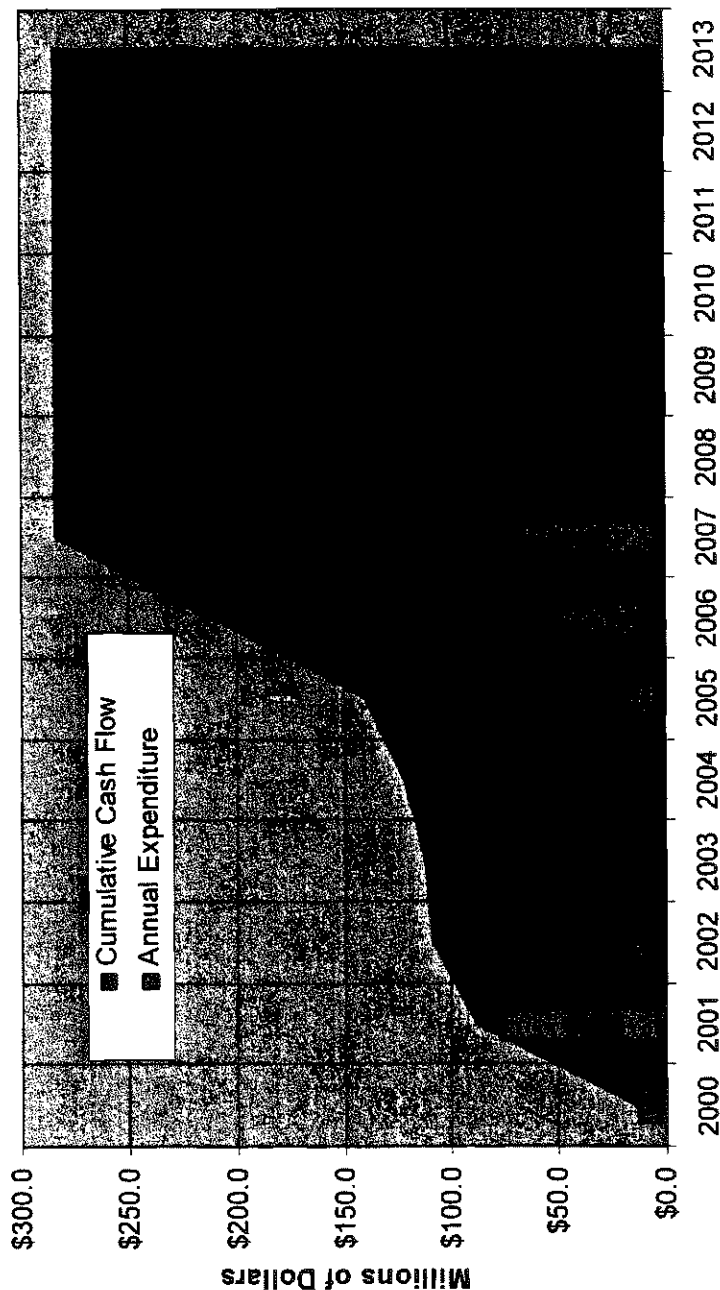
Permit to Install:

Unit 3 Pollution Control & Efficiency Enhancement Project

Unit 3 Pollution Control & Efficiency Enhancement Permit to Install of November 1999	2006	2007	2008	2009	2010	2011	Total (06-11)
Steam Turbine Upgrade	\$0.8	\$0.1					\$0.9
Boiler Feed Booster & Feed Pump Turbine Upgrades							
Distributed Control System & Neural Network Installation							
Electrostatic Precipitator Maintenance	\$7.2	\$0.2					\$7.4
Coal Pulverizer, Feeder & Bunker Upgrades	\$9.0	\$2.7					\$11.7
Fuel Management Optimization	\$46.0	\$63.0					\$109.0
Boiler Upgrade	\$8.0	\$7.0					\$15.0
Project Management & Engineering Oversight							
Project Sub-Total	\$71.0	\$73.0					\$144.0

Permit to Install:

Unit 3 Pollution Control & Efficiency Enhancement Project



Permit Status Summary

Permit to Install:

Coal Handling Facility Upgrade Project

• Authorized Projects

- Coal Handling Equipment Improvements
- Operation Changes
- Upgrades to Accommodate Higher Volumes of Western Coal

• Schedule

- Submitted Aug 00
- PTI Issued Dec 00
- Completion Dec 03
- Completion (1st Update) May 02
- Completion (Current) Complete



Project To-Date Expenditures

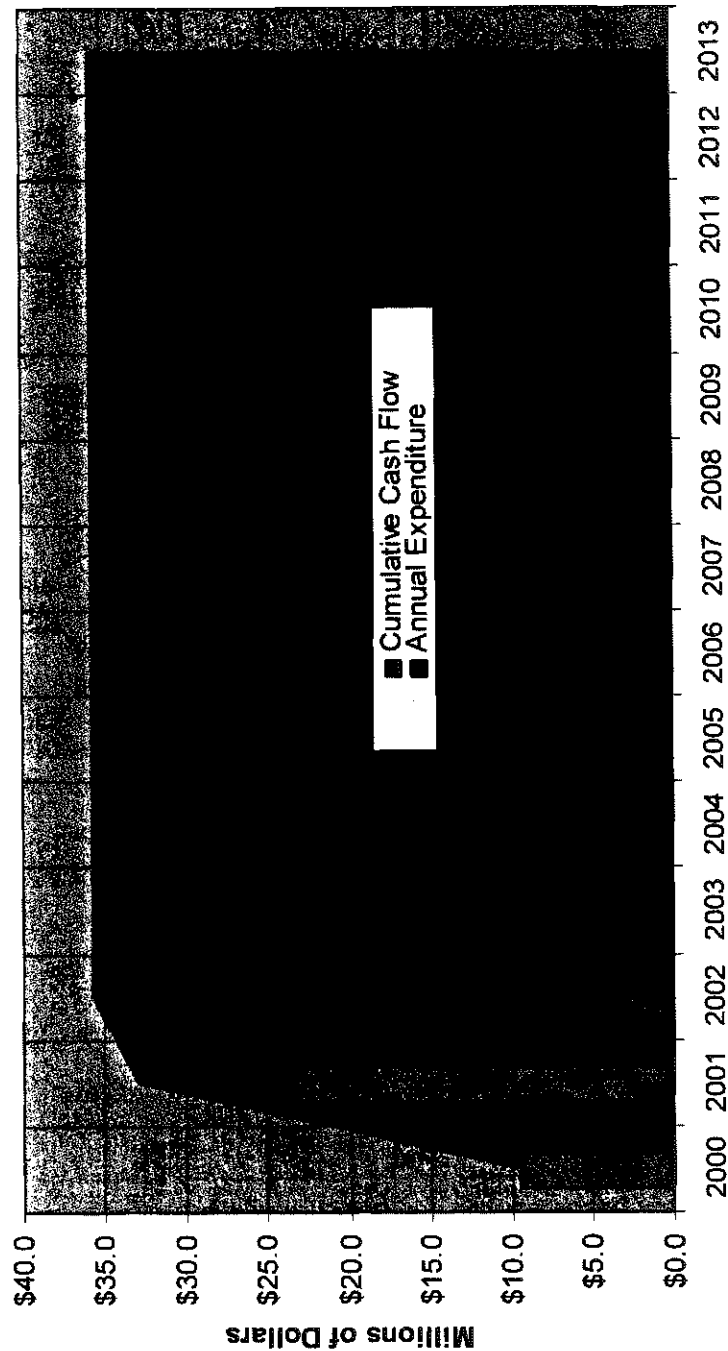
Permit to Install:

Coal Handling Facility Upgrade Project

Coal Handling Facility Upgrades Permit to Install of December 2000	2000	2001	2002	2003	2004	2005	Total (00-05)
Unit 1 Coal Bunker Upgrade	\$0.7	\$2.3					\$2.3
Fuel Handling DCS Installation	\$2.8	\$4.7	\$2.7				\$8.1
Unit 3 Dumper Upgrade		\$0.1					\$2.9
Dust Collector Replacements	\$4.0	\$13.1					\$17.1
Modify Rail Layout	\$0.8	\$3.2					\$4.0
31B Tripper Replacement	\$1.2		\$0.2				\$1.2
Coal Yard Sprinkler System Upgrade							\$0.2
Project Sub-Total	\$9.5	\$23.4	\$2.9				\$35.8

Permit Status: Cash Flow

Permit to Install: Coal Handling Facility Upgrade Project



Permit Status Summary

Permit to Install:

Units 2 & 3 SCR Projects

• Authorized Projects

- SCR on Unit 2
- SCR on Unit 3
- Ancillary Equipment

• Schedule

- Submitted Nov 01
- PTI Issued May 02
- Completion Jun 04
- Completion (1st Update) May 06
- Completion (Current) Apr 07 (U3)
- Completion (Current) Nov 11 (U2)



Project To-Date Expenditures

Permit to Install:

Units 2 & 3 SCR Projects

Units 2 & 3 SCR Permit to Install of May 2002	2000	2001	2002	2003	2004	2005	Total (00-05)
		\$2.9 \$2.3	\$4.4 \$16.3	\$8.9 \$0.9	\$51.3 \$1.2	\$45.9 \$3.0	\$113.4 \$23.7
Unit 3 SCR Installation							
Unit 2 SCR Installation							
Project Sub-Total		\$5.2	\$20.7	\$9.8	\$52.5	\$48.9	\$137.1

Future Expenditures

Permit to Install:

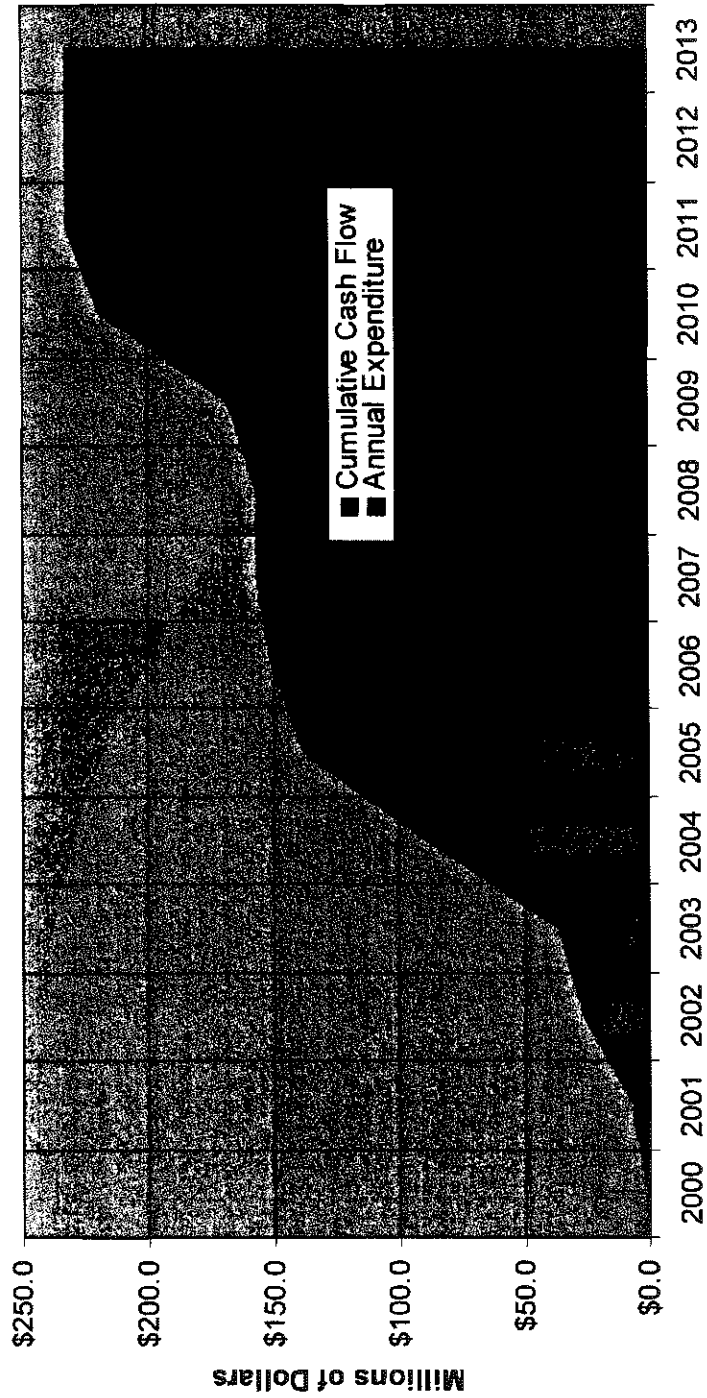
Units 2 & 3 SCR Projects

Units 2 & 3 SCR Permit to Install of May 2002	2006	2007	2008	2009	2010	2011	Total (06-11)
Unit 3 SCR Installation	\$12.6	\$6.0					\$18.6
Unit 2 SCR Installation	\$0.3	\$0.1	\$0.1	\$11.0	\$50.5	\$13.4	\$75.4
Project Sub-Total	\$12.9	\$6.1	\$0.1	\$11.0	\$50.5	\$13.4	\$94.0



Permit Status: Cash Flow

Permit to Install: Units 2 & 3 SCR Projects



NSR Post-Project Reporting Requirements

- Tracking and Reporting Post-Change Emissions
 - *WEPCO Rule*: **Annual basis for a period of 5 years following the project**, or up to 10 years at the request of the Administrator.
 - *NSR Reform*: Annual emissions within 60 days after end of year for 5 years following a return to regular operation, or for **10 years if modification project increases design capacity** or potential to emit.

Projected Emissions Compliance

- Consumers has been complying with the post-change emissions tracking and reporting provisions since 2001.

	PM (tpy)	SO ₂ (tpy)	NO _x (tpy)
Actual 12-Month Rolling Emissions Average (3/01)	662	26,413	10,060
Actual 12-Month Rolling Emissions Average (3/02)	462	22,836	10,911
Actual 12-Month Rolling Emissions Average (3/03)	457	24,273	10,773
Actual 12-Month Rolling Emissions Average (3/04)	457	23,961	11,555
Actual 12-Month Rolling Emissions Average (3/05)	435	20,384	9,965
Permit Emission Limit (PTI No. 287-76B)	1,080	31,650	18,750

- Annual reports provide a demonstration that any emissions above baseline are due to demand growth.

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- Construction schedules have impacted by developments under the NOx transport rulemakings, resulting in schedule adjustments and an additional permit for SCR installations.
- Although construction schedules are expanded, the continuous project progress and committed cash flow clearly meets the criteria for continuous construction, and the permits should remain valid.



Consumers Energy Memorandum

To: Mr. Greg Griffin

From: Jason Prentice *J. M. P.*

Date: December 15, 2006

Subject: Thermal Evaporation of EDTA Based Cleaning Solutions In Whiting Units 1-3

cc: Colin Dunham, Ward Wilson, Ken Evans

The Equipment Performance Testing Section (EPTS) has inquired about the possibility of thermally evaporating used boiler cleaning solutions in JR Whiting Units 1-3. E&LS-AQ's current understanding regarding the thermal treatment of the boiler cleaning solution is as follows:

1. The boiler cleaning solutions to be thermally evaporated would consist of used solutions of ethylene-diamine-tetracetic acid (EDTA) and ammoniated EDTA. Any used boiler cleaning solutions to be thermally treated in Whiting Units 1-3 would be generated on-site.
2. The boiler cleaning solutions will be injected at a rate of approximately 40 to 50 gallons per minute (gpm), with a total of 40,000 to 50,000 gallons of cleaning solution being injected before the solution is drained from the boiler.
3. For each boiler, injection of cleaning solution will occur twice. The majority of the boiler cleaning will be accomplished during the first injection of EDTA/ammoniated EDTA cleaning solution. After the initial cleaning has occurred, the solution will be drained and stored in a holding tank. Rinsing of the boiler will then be accomplished during a second injection of EDTA/ammoniated EDTA cleaning solution, which will also be drained and stored in the same holding tank used to collect the initial cleaning solution.
4. A composite sample of the used EDTA/ammonia EDTA solution will be obtained from the holding tank and analyzed to determine if the material is characteristically hazardous. If the material is characteristically hazardous, it will be disposed of in an environmentally acceptable manner (i.e. off-site treatment or disposal).
5. The used boiler cleaning solutions from an individual boiler cleaning cycle (i.e. initial injection and rinse) are expected to contain approximately 1,000 to 2,000 pounds of metallic compounds, the majority of which will be iron derivatives.
6. The thermal evaporation of boiler cleaning solutions will likely occur in January of 2008.

EPTS has specifically asked whether the thermal evaporation of used boiler cleaning solutions is allowed in the current Renewable Operating Permit (i.e. air permit) for the JR Whiting Plant. Assuming that the current ROP does not allow thermal evaporation of used boiler cleaning solutions, EPTS has also asked whether there are any relevant air quality permitting exemptions or, in the absence of such exemptions, how long it would take to obtain an air quality permit that would allow the firing of used boiler cleaning solutions in JR Whiting Units 1-3.

Current Renewable Operating Permit

The current ROP for the JR Whiting Plant is identified as MI-ROP-B2846-2006. The applicable requirements for each of Units 1, 2 and 3 are listed in ROP Tables EU-BOILER1-S1, EU-BOILER2-S1 and EU-BOILER3-S1, respectively. In addition, applicable requirements that are common to Units 1-3 are also listed in Table FG-BOILERS-S1. Attachment 1 contains a copy of ROP Tables EU-BOILER1-S1, EU-BOILER2-S1, EU-BOILER3-S1 and FG-BOILERS-S1.

Based upon a review of the ROP and aforementioned tables, Units 1-3 are allowed to combust coal, fuel oil (for startup purposes), supplemental fuels, and freeze conditioning/dust suppression agents that are applied to the coal. The allowed supplemental fuels include used solvents (Penetone 647 or TPC) and specification used oils. Therefore, the current ROP does not appear to allow the thermal evaporation of boiler cleaning solutions in Units 1-3.

Relevant Air Quality Permitting Exemptions

Unless allowed by Rule 336.1202 or 336.1278 to 336.1290, Michigan Rule 201(1) requires that a person not install, construct, reconstruct, relocate, or modify any process or process equipment, including control equipment pertaining thereto, which may emit any air contaminant, unless a permit to install (PTI) authorizing such action has been issued by the Michigan Air Quality Division (AQD).

Rule 336.1202 allows the Michigan AQD to grant a waiver of approval for certain construction activities; this exemption is not really applicable and is not discussed further. Rule 336.1278 contains the applicability criteria for the permitting exemptions, and the specific exemptions are listed in Rules 336.1280 through 336.1290.

As noted, Michigan Rule 336.1278 contains criteria which an activity must meet in order to be eligible to apply any of the exemptions that are provided in Rules 336.1280 through 336.1290. Among the various criteria in R 336.1278 are the following:

- The activity is not subject to 40 CFR 52.21, prevention of significant deterioration (PSD) regulations, or R 336.1220, nonattainment new source review regulations.
- The activity will not result in an increase in actual emissions greater than the significant emission rates defined in Rule 336.1119. The significant emission rates, expressed as tons per year, are as follows: $\text{NO}_x = 40$, $\text{CO} = 100$, $\text{SO}_2 = 40$, Particulate Matter (PM) = 25, PM-10 = 15, VOCs = 40 and Lead = 0.6.
- The activity must not involve the construction or reconstruction of a major source of hazardous air pollutants as defined in 40 CFR Part 63.
- The activity must not involve the construction or modification of a major source of hazardous air pollutants as defined in 40 CFR Part 61.

The chemical formula of EDTA and ammoniated EDTA are $\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_8$ and $\text{C}_{10}\text{H}_{16}\text{N}_2\text{O}_8 \cdot x\text{NH}_3$, respectively. Thus, the thermal evaporation of EDTA and ammoniated EDTA is expected to result in emissions of carbon dioxide (CO_2), nitrogen (N_2) and water (H_2O). The emissions of CO_2 , N_2 and H_2O are not regulated pursuant to 40 CFR 52.21 or R 336.1220, and there are no applicable significant emission rates under Rule 336.1278.

Please note that although the available nitrogen is increased by the addition of EDTA and ammoniated EDTA solution, this is not expected to result in an increase in NO_x emissions. Studies conducted on the impact of thermal evaporation of EDTA and ammoniated EDTA solutions indicate that the evaporation process results in lower flame temperatures and oxygen contents within the boiler. These conditions (i.e. lower flame temperatures and O_2 content) help to reduce the oxidation of the available nitrogen, and the increased nitrogen loading is essentially emitted as N_2 rather than NO_x .

The used boiler cleaning solution will also contain metallic compounds that are removed from the boiler surfaces. Based upon conversations with the EPTS, the total amount of metallic compounds contained in the used boiler cleaning solutions is not expected to exceed approximately 2,000 pounds. During the thermal evaporation of the used boiler cleaning solution, the metallic compounds will be converted to metal oxides which will combine with the bottom and fly ash. These metallic oxides will be controlled by the electrostatic precipitators (ESPs) that are used to control the particulate matter emissions from the boilers. The ESP's are have a design control efficiency of 99% by weight, so the controlled metallic oxides emissions resulting from the thermal evaporation of boiler cleaning solution is expected to be less than 20 pounds ($2,000 \text{ lbs} \times (1-0.99) = 20 \text{ lbs}$) per boiler cleaning cycle.

For any given boiler cleaning cycle, the increases in the actual emissions of NO_x , PM and PM-10 will be negligible. Based upon the expected emission rates from the thermal evaporation of the boiler cleaning solution, the activity will not be subject to the PSD regulations of 40 CFR 52.21 or the nonattainment regulations of Rule 336.1220. Furthermore, the proposed activity does not involve the construction, reconstruction or modification of a major source of hazardous air pollutants as defined in 40 CFR Parts 61 or 63. Therefore, Michigan Rule 336.1278 does not preclude the use of the permit to install exemptions provided within Rules 336.1280 through 336.1290.

Of the various permit to install exemptions provided in Rules 336.1280 through 336.1290, the most applicable exemption appears to be Rule 336.1285(z). This rule exempts the combustion of boiler cleaning wastes, and the regulatory text is as follows:

Rule 336.1285(z) Combustion of boiler cleaning solutions that were solely used for or intended for cleaning internal surfaces of boiler tubes and related steam and water cycle components if the solution burned is not designated, by listing or specified characteristic, as hazardous pursuant to federal regulations or state rules.

When developing a rationale for the exemption provided in Rule 336.1285(z), the Michigan Air Quality Division specifically used the thermal evaporation of ammoniated EDTA solution as an example; an excerpt from the relevant document is provided as Attachment 2. Within the discussion, the Michigan AQD states that "Staff have previously evaluated this process and determined that the cleaning process does not result in a quantifiable increase in emissions." This supports the use of the exemption provided in Rule 336.1285(z) and our conclusion that the increase in actual emissions will be negligible.

In applying the Rule 336.1285(z) exemption, it will be critical to demonstrate that the boiler cleaning solution to be thermally evaporated is not classified as hazardous waste pursuant to current state or federal regulations. E&LS-AQ directs EPTS to coordinate the sampling and analysis of the used boiler cleaning solution with Mr. Ward Wilson or other appropriate person within the E&LS Remediation Management Section. This will help to ensure that the appropriate boiler cleaning solution characteristics (i.e. ignitability, corrosivity, reactivity and toxicity) are determined and then compared to the applicable state and federal criteria.

Please note that with the use of the exemption, there will not be any limitation on the addition rate of the boiler cleaning solution to the boilers. Furthermore, there will not be any limitation on the number of boilers that can simultaneously thermally evaporate the cleaning solution, and there is no obligation to provide a notice to the Michigan AQD before the cleaning solution is evaporated.

Notwithstanding the absence of limitations on firing rate, etc., any boiler that thermally evaporates boiler cleaning solution will still have to comply with any applicable limitations, including both emission and opacity limitations.

For reference, copies of Michigan Rules 336.1201, 336.1278 and 336.1285 are presented within Attachment 3.

Obtaining an Air Quality Permit

In light of the exemption provided in Rule 336.1285(z), E&LS-AQ believes that it is not necessary to obtain a permit to install to thermally evaporate boiler cleaning solutions. However, the facility could still seek a PTI to authorize the thermal evaporation of boiler cleaning solution in JR Whiting Units 1-3. Similar permits were sought and granted for JH Campbell Units 1, 2 and 3, BC Cobb Units 4 and 5, DE Karn Units 1 and 2, and JC Weadock Units 7 and 8. It is E&LS-AQ's belief that the aforementioned permits authorizing the thermal evaporation of boiler cleaning solutions were granted before the effective date of Rule 336.1285(z).

If a PTI were desired, E&LS-AQ estimates that the permitting process would take approximately three to six months. As similar PTIs have been issued for other Consumers Energy coal-fired boilers, the permitting process should be relatively straightforward.

Conclusions and Recommendations

Based upon a review of the current ROP for the JR Whiting Plant, E&LS-AQ has concluded that the current ROP does not allow the thermal evaporation of boiler cleaning solutions. However, Michigan Rule 336.1285(z) provides a permitting exemption for the combustion of boiler cleaning solutions as long as the solution is not classified as hazardous pursuant to state and federal regulations. E&LS-AQ directs EPTS to work with the E&LS Remediation Management Section to sample and analyze the used boiler cleaning solution to ensure that it is not hazardous under state and federal regulations.

In reviewing this memorandum, please note that only air quality regulations have been evaluated. Other sections with the Environmental and Laboratory Services Department should be consulted as necessary to ensure compliance with other environmental regulations.

If you have any questions or concerns regarding this memorandum, please contact E&LS-AQ.

Attachment 1

**ROP MI-ROP-B2846-2006, Tables EU-BOILER-S1, EU-BOILER2-S1,
EU-BOILER3-S1 and FG-BOILERS-S1**

**EU- BOILER1-S1
EMISSION UNIT CONDITIONS**

DESCRIPTION

Boiler #1

Flexible Group ID: FG-BOILERS-S1

POLLUTION CONTROL EQUIPMENT

Electrostatic precipitator

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Particulate Matter	260 pounds per hour ²	Determined on a daily average	EU-BOILER1-S1	S.C. V.1	R 336.1331
2. Particulate Matter	0.20 pounds ²	Per 1000 pounds of exhaust gases, corrected to 50% excess air	EU-BOILER1-S1	S.C. V.1	R 336.1331
3. Sulfur Dioxide	1,900 pounds per hour ²	Determined on a daily average	EU-BOILER1-S1	S.C. VI.1	R 336.1401
4. Nitrogen Oxide	1,000 pounds per hour ²	Determined on a daily average	EU-BOILER1-S1	S.C. VI.1	R 336.1205(3)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. N/A	N/A	N/A	N/A	N/A	N/A

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. N/A

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. The facility shall not operate Boiler #1 unless the associated electrostatic precipitator is installed and operating properly.² (R 336.1910)

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. Once during the term of this permit, or more frequently upon request of AQD, permittee shall verify the PM emission rate from EU-BOILER1-S1 by testing, utilizing U.S. EPA Reference Method 17 or other AQD approved test method. Verification of emission rates includes the submittal of a complete report of the test results within 60 days of test completion. (R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)
2. The permittee shall submit a complete test protocol to the AQD for approval at least 30 days prior to the anticipated test date. (R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)
3. The permittee shall notify the AQD no less than 7 days prior to the anticipated test date. (R 336.2001(3))

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. Applicant shall monitor and record the opacity, exhaust gas flow rate and concentrations of sulfur dioxide and nitrogen oxides in the exhaust gas from Boiler #1 on a continuous basis in a manner and with instrumentation acceptable to the Air Quality Division. All data shall be kept on file for a period of at least five years and made available to the AQD upon request. (40 CFR Part 75)
2. The permittee shall utilize COMS-recorded opacity as an indicator of the proper functioning of the electrostatic precipitator. An excursion will occur if opacity in excess of 20%, except for one 6-minute average per hour of not more than 27% opacity, is recorded for a duration exceeding two continuous hours. (40 CFR 64.6(c)(1)(i and ii), (40 CFR 64.6(c)(2)))
3. The permittee shall continuously record opacity; six-minute average values shall be based on 24 or more equally spaced instantaneous opacity measurements per six-minute period. (40 CFR 64.6(c)(1)(iii))
4. The permittee shall complete daily zero and calibration tests; conduct necessary preventative maintenance; and demonstrate adequate performance through an annual monitor audit. (40 CFR 64.6(c)(1)(iii))
5. The permittee shall conduct all required monitoring per the CAM Plan attached as Appendix 3.2 and otherwise satisfy the requirements specified in 40 CFR 64.7 through 40 CFR 64.9 (40 CFR 64.6(c)(3), 40 CFR 64.7(a))
6. The permittee shall properly maintain the monitoring systems, including maintaining necessary parts for routine repairs of the monitoring equipment. (40 CFR 64.7(b))
7. The required monitoring systems shall collect data for all required intervals when the emission unit is operating. (40 CFR 64.7(c))
8. The permittee shall restore operation of the emission unit, control device, and associated pollutant capture system equipment to normal/compliant operation as quickly as possible in response to any noted exceedance or excursion. (40 CFR 64.7(d))
9. The permittee shall promptly notify AQD for the need to modify the CAM Plan if it is found to be inadequate, and shall submit a proposed modification to the ROP if necessary. (40 CFR 64.7(e))

See Appendix 3

VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))

3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Quarterly reporting of monthly excess opacity emissions, (including the nature and cause of the periods of excess emissions), and of the dates and times of the monitoring systems being inoperative. If the monitoring system has not been inoperative, repaired, or adjusted, and/or if no excess emissions occurred, provide a statement attesting to this fact. Each quarterly report is due within 30 days of the end of the calendar quarter reporting period. **(R 336.2170)**
5. Quarterly reporting of the monthly sulfur dioxide emissions (including the magnitude and nature and cause of periods of excess emissions) for each averaging period during which the applicable standard was exceeded. Each quarterly report is due within 30 days of the end of the calendar quarter reporting period. **(R 336.1213(3))**
6. Permittee shall report sulfur dioxide, nitrogen oxide and carbon dioxide emissions, volumetric flow, and opacity data in accordance with 40 CFR, Part 75 (Continuous Emission Monitoring). **(R 336.1213(3))**
7. Semiannually or more frequently report Compliance Assurance Monitoring (CAM) summary information on the number, duration, and cause of exceedances/excursions in the reporting period, and the corrective actions taken in response. If there were no excursions/exceedances in the reporting period, then this report shall include a statement that there were no excursions/exceedances. CAM reports shall be postmarked or received by appropriate AQD district office pursuant to the time frames identified for quarterly or semiannual reporting. **(40 CFR 64.9(a)(2)(i), R 336.1213(3)(c))**
8. Semiannually report or more frequently report Compliance Assurance Monitoring (CAM) summary information on monitor downtime in the reporting period. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. CAM reports shall be postmarked or received by appropriate AQD district office pursuant to the time frames identified for quarterly or semiannual reporting. **(40 CFR 64.9(a)(2)(ii), R 336.1213(3)(c))**
9. If a Quality Improvement Plan (QIP) is required, report pursuant **40 CFR 64.9(a)(2)(iii)**.

See Appendix 8

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBOILER1-S1	132 ²	297 ²	R 336.1201(3)

IX. OTHER REQUIREMENT(S)

1. N/A

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

EU-BOILER2-S1 EMISSION UNIT CONDITIONS

DESCRIPTION

Boiler #2.

Flexible Group ID: FG-BOILERS-S1

POLLUTION CONTROL EQUIPMENT

Electrostatic precipitator

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Particulate Matter	290 pounds per hour ²	Determined on a daily average	EU-BOILER2-S1	S.C. V.1	R 336.1331
2. Particulate Matter	0.20 pounds ²	per 1000 pounds of exhaust gases, corrected to 50% excess air	EU-BOILER2-S1	S.C. V.1	R 336.1331
3. Sulfur Dioxide	2,100 pounds per hour ²	Determined on a daily average	EU-BOILER2-S1	S.C. VI.1	R 336.1401
4. Nitrogen Oxide	1,160 pounds per hour ²	Determined on a daily average	EU-BOILER2-S1	S.C. VI.1	R 336.1205(3)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. N/A	N/A	N/A	N/A	N/A	N/A

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. N/A

IV. DESIGN/EQUIPMENT PARAMETER(S)

- The facility shall not operate Boiler #2 unless the associated electrostatic precipitator is installed and operating properly.² (R 336.1910)

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

Section 1

ROP No: MI-ROP-B2846-2006
Expiration Date: June 2, 2011
PTI No: MI-PTI-B2846-2006

1. Once during the term of this permit, or more frequently upon request of AQD, permittee shall verify the PM emission rate from EU-BOILER2-S1 by testing, utilizing U.S. EPA Reference Method 17 or other AQD approved test method. Verification of emission rates includes the submittal of a complete report of the test results within 60 days of test completion. (R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)
2. The permittee shall submit a complete test protocol to the AQD for approval at least 30 days prior to the anticipated test date. (R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)
3. The permittee shall notify the AQD no less than 7 days prior to the anticipated test date. (R 336.2001(3))

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. Applicant shall monitor and record the opacity, exhaust gas flow rate and concentrations of sulfur dioxide and nitrogen oxides in the exhaust gas from Boiler #2 on a continuous basis in a manner and with instrumentation acceptable to the Air Quality Division. All data shall be kept on file for a period of at least five years and made available to the Air Quality Division upon request. (40 CFR Part 75)
2. The permittee shall utilize COMS-recorded opacity as an indicator of the proper functioning of the electrostatic precipitator. An excursion will occur if opacity in excess of 20%, except for one 6-minute average per hour of not more than 27% opacity, is recorded for a duration exceeding two continuous hours. (40 CFR 64.6(c)(1)(i and ii), (40 CFR 64.6(c)(2)))
3. The permittee shall continuously record opacity; six-minute average values shall be based on 24 or more equally spaced instantaneous opacity measurements per six-minute period. (40 CFR 64.6(c)(1)(iii))
4. The permittee shall complete daily zero and calibration tests; conduct necessary preventative maintenance; and demonstrate adequate performance through an annual monitor audit. (40 CFR 64.6(c)(1)(iii))
5. The permittee shall conduct all required monitoring per the CAM Plan as Appendix 3.2 and otherwise satisfy the requirements specified in 40 CFR 64.7 through 40 CFR 64.9 (40 CFR 64.6(c)(3), 40 CFR 64.7(a))
6. The permittee shall properly maintain the monitoring systems, including maintaining necessary parts for routine repairs of the monitoring equipment. (40 CFR 64.7(b))
7. The required monitoring systems shall collect data for all required intervals when the emission unit is operating. (40 CFR 64.7(c))
8. The permittee shall restore operation of the emission unit, control device, and associated pollutant capture system equipment to normal/compliant operation as quickly as possible in response to any noted exceedance or excursion. (40 CFR 64.7(d))
9. The permittee shall promptly notify AQD for the need to modify the CAM Plan if it is found to be inadequate, and shall submit a proposed modification to the ROP if necessary. (40 CFR 64.7(e))

See Appendix 3

VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))

3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for the previous calendar year. (R 336.1213(4)(c))
4. Quarterly reporting of monthly excess opacity emissions, (including the nature and cause of the periods of excess emissions), and of the dates and times of the monitoring systems being inoperative. If the monitoring system has not been inoperative, repaired, or adjusted, and/or if no excess emissions occurred, provide a statement attesting to this fact. Each quarterly report is due within 30 days of the end of the calendar quarter reporting period. (R 336.2170)
5. Quarterly reporting of the monthly sulfur dioxide emissions (including the magnitude and nature and cause of periods of excess emissions) for each averaging period during which the applicable standard was exceeded. Each quarterly report is due within 30 days of the end of the calendar quarter reporting period. (R 336.1213(3))
6. Permittee shall report sulfur dioxide, nitrogen oxide and carbon dioxide emissions, volumetric flow, and opacity data in accordance with 40 CFR, Part 75 (Continuous Emission Monitoring). (R 336.1213(3))
7. Semiannually or more frequently report Compliance Assurance Monitoring (CAM) summary information on the number, duration, and cause of exceedances/excursions in the reporting period, and the corrective actions taken in response. If there were no excursions/exceedances in the reporting period, then this report shall include a statement that there were no excursions/exceedances. CAM reports shall be postmarked or received by appropriate AQD district office pursuant to the time frames identified for quarterly or semiannual reporting. (40 CFR 64.9(a)(2)(i), R 336.1213(3)(c))
8. Semiannually report or more frequently report Compliance Assurance Monitoring (CAM) summary information on monitor downtime in the reporting period. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. CAM reports shall be postmarked or received by appropriate AQD district office pursuant to the time frames identified for quarterly or semiannual reporting. (40 CFR 64.9(a)(2)(ii), R 336.1213(3)(c))
9. If a Quality Improvement Plan (QIP) is required, report pursuant 40 CFR 64.9(a)(2)(iii).

See Appendix 8

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBOILER2-S1	132 ²	297 ²	R 336.1201(3)

IX. OTHER REQUIREMENT(S)

1. N/A

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

EU-BOILER3-S1 EMISSION UNIT CONDITIONS

DESCRIPTION

Boiler #3

Flexible Group ID: FG-BOILERS

POLLUTION CONTROL EQUIPMENT

Electrostatic precipitator

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Particulate Matter	290 pounds per hour ²	Determined on a daily average	EU-BOILER3-S1	S.C. V.1	R 336.1331
2. Particulate Matter	0.19 pounds ²	per 1000 pounds of exhaust gases, corrected to 50% excess air	EU-BOILER3-S1	S.C. V.1	R 336.1331
3. Sulfur Dioxide	2,400 pounds per hour ²	Determined on a daily average	EU-BOILER3-S1	S.C. VI.1	R 336.1401
4. Nitrogen Oxide	1,590 pounds per hour ²	Determined on a daily average	EU-BOILER3-S1	S.C. VI.1	R 336.1205(3)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. N/A	N/A	N/A	N/A	N/A	N/A

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. N/A

IV. DESIGN/EQUIPMENT PARAMETER(S)

- The facility shall not operate Boiler #3 unless the associated electrostatic precipitator is installed and operating properly.² (R 336.1910)

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. Once during the term of this permit, or more frequently upon request of AQD, permittee shall verify the PM emission rate from EU-BOILER3-S1 by testing, utilizing U.S. EPA Reference Method 17 or other AQD approved test method. Verification of emission rates includes the submittal of a complete report of the test results within 60 days of test completion. (R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)
2. The permittee shall submit a complete test protocol to the AQD for approval at least 30 days prior to the anticipated test date. (R 336.1213(3), R 336.2001, R 336.2003, R 336.2004)
3. The permittee shall notify the AQD no less than 7 days prior to the anticipated test date. (R 336.2001(3))

See Appendix 5

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. Applicant shall monitor and record the opacity, exhaust gas flow rate and concentrations of sulfur dioxide and nitrogen oxides in the exhaust gas from Boiler #3 on a continuous basis in a manner and with instrumentation acceptable to the Air Quality Division. All data shall be kept on file for a period of at least five years and made available to the Air Quality Division upon request. (40 CFR Part 75)
2. The permittee shall utilize COMS-recorded opacity as an indicator of the proper functioning of the electrostatic precipitator. An excursion will occur if opacity in excess of 20%, except for one 6-minute average per hour of not more than 27% opacity, is recorded for a duration exceeding two continuous hours. (40 CFR 64.6(c)(1)(i and ii), 40 CFR 64.6(c)(2))
3. The permittee shall continuously record opacity; six-minute average values shall be based on 24 or more equally spaced instantaneous opacity measurements per six-minute period. (40 CFR 64.6(c)(1)(iii))
4. The permittee shall complete daily zero and calibration tests; conduct necessary preventative maintenance; and demonstrate adequate performance through an annual monitor audit. (40 CFR 64.6(c)(1)(iii))
5. The permittee shall conduct all required monitoring per the CAM Plan as appendix 3.2 and otherwise satisfy the requirements specified in 40 CFR 64.7 through 40 CFR 64.9 (40 CFR 64.6(c)(3), 40 CFR 64.7(a))
6. The permittee shall properly maintain the monitoring systems, including maintaining necessary parts for routine repairs of the monitoring equipment. (40 CFR 64.7(b))
7. The required monitoring systems shall collect data for all required intervals when the emission unit is operating. (40 CFR 64.7(c))
8. The permittee shall restore operation of the emission unit, control device, and associated pollutant capture system equipment to normal/compliant operation as quickly as possible in response to any noted exceedance or excursion. (40 CFR 64.7(d))
9. The permittee shall promptly notify AQD for the need to modify the CAM Plan if it is found to be inadequate, and shall submit a proposed modification to the ROP if necessary. (40 CFR 64.7(e))

See Appendix 3

VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))

3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for the previous calendar year. **(R 336.1213(4)(c))**
4. Quarterly reporting of monthly excess opacity emissions, (including the nature and cause of the periods of excess emissions), and of the dates and times of the monitoring systems being inoperative. If the monitoring system has not been inoperative, repaired, or adjusted, and/or if no excess emissions occurred, provide a statement attesting to this fact. Each quarterly report is due within 30 days of the end of the calendar quarter reporting period. **(R 336.2170)**
5. Quarterly reporting of the monthly sulfur dioxide emissions (including the magnitude and nature and cause of periods of excess emissions) for each averaging period during which the applicable standard was exceeded. Each quarterly report is due within 30 days of the end of the calendar quarter reporting period. **(R 336.1213(3))**
6. Permittee shall report sulfur dioxide, nitrogen oxide and carbon dioxide emissions, volumetric flow, and opacity data in accordance with 40 CFR, Part 75 (Continuous Emission Monitoring). **(R 336.1213(3))**
7. Semiannually or more frequently report Compliance Assurance Monitoring (CAM) summary information on the number, duration, and cause of exceedances/excursions in the reporting period, and the corrective actions taken in response. If there were no excursions/exceedances in the reporting period, then this report shall include a statement that there were no excursions/exceedances. CAM reports shall be postmarked or received by appropriate AQD district office pursuant to the time frames identified for quarterly or semiannual reporting. **(40 CFR 64.9(a)(2)(i), R 336.1213(3)(c))**
8. Semiannually report or more frequently report Compliance Assurance Monitoring (CAM) summary information on monitor downtime in the reporting period. If there were no periods of monitor downtime in the reporting period, then this report shall include a statement that there were no periods of monitor downtime. CAM reports shall be postmarked or received by appropriate AQD district office pursuant to the time frames identified for quarterly or semiannual reporting. **(40 CFR 64.9(a)(2)(ii), R 336.1213(3)(c))**
9. If a Quality Improvement Plan (QIP) is required, report pursuant **40 CFR 64.9(a)(2)(iii)**.

See Appendix 8

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBOILER3-S1	142 ²	297 ²	R 336.1201(3)

IX. OTHER REQUIREMENT(S)

1. N/A

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

FG-BOILERS-S1
FLEXIBLE GROUP CONDITIONS

DESCRIPTION

Boilers 1, 2, and 3.

Emission Units: EU-BOILER1-S1, EU-BOILER2-S1, EU-BOILER3-S1**POLLUTION CONTROL EQUIPMENT**

Electrostatic Precipitators

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Particulate matter	1,915 tons ²	Per year based on a 12 month rolling time period	FG-BOILERS-S1	S.C. V.1 of Tables EU-BOILER1-S1, EU-BOILER2-S1, and EU-BOILER3-S1	R 336.1205(3)
2. Nitrogen Oxides	10,490 tons ²	Per year based on a 12 month rolling time period	FG-BOILERS-S1	S.C. VI.6	R 336.1205(3)
3. Carbon Monoxide	400 tons ²	Per year based on a 12 month rolling time period	FG-BOILERS-S1	S.C. VI.5	R 336.1205(3)
4. Sulfur Dioxide	1.67 pounds per million Btu heat input ²	Monthly average based on the average of the previous 31 operating days	FG-BOILERS-S1	S.C. VI.6 (CEMS; see Appendix 3)	R 336.1401
5. Sulfur Dioxide	16,450 tons ²	Per year based on a 12 month rolling time period	FG-BOILERS-S1	S.C. VI.6	R 336.1205(3)

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Supplemental Fuel	64 gallons of used solvent ^{#, 2}	Per hour based on a daily average	FG-BOILERS-S1	S.C. VI.1 S.C. VI.2	R 336.1201(3)
2. Supplemental Fuel	550 gallons of used solvent ^{#, 2}	Per month	FG-BOILERS-S1	S.C. VI.1 S.C. VI.2	R 336.1201(3)
3. Supplemental Fuel	5500 gallons of specification used oil ^{@, 2}	Per month	FG-BOILERS-S1	S.C. VI.3 S.C. VI.4	R 336.1201(3), R 336.1225
4. Coal – sulfur content	1.0% by weight, calculated on the basis of 12,000Btu/lb for solid fuels	Monthly average based on the average of the previous 31 operating days	EU-BOILER1-S1, EU-BOILER2-S1, EU-BOILER3-S1 (This limit is applicable to each individual boiler)	S.C. VI.6 (CEMS: see Appendix 3)	R 336.1401

- Used solvents shall be either Penetone 647 or TPC or a 647/TPC blend

@ - Specification used oil that has been contaminated with halogenated solvents, such that the total halogen solvent of the used oil is greater than 1000 ppm, shall not be used as supplemental fuel.

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. Applicant shall not burn the freeze conditioning and dust suppression agents unless the electrostatic precipitator is installed and operating properly.² (R 336.1910)
2. The applicant shall not operate the Boilers #1, #2, or #3 steam generating units unless a fugitive dust control plan approvable by the District Supervisor, Air Quality Division has been implemented and is maintained.² (R 336.1372)

IV. DESIGN/EQUIPMENT PARAMETER(S)

1. Permittee shall not operate the pulverized coal-fired Boilers #1, #2, and #3, which are each controlled by an electrostatic precipitator control system, unless each transformer-rectifier set of the associated electrostatic precipitator is equipped with a saturable core reactor, silicon-controlled rectifier linear reactor, or equivalent automatic control system. (R 336.1330(1))
2. Each transformer-rectifier set shall be capable of operating in a spark-limited mode and shall meter and display the primary RMS voltage and amperage, and the average secondary amperage. (R 336.1330(2))

V. TESTING/SAMPLING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. N/A

See Appendix 5

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of 5 years. (R 336.1213(3)(b)(ii))

1. Facility shall analyze a composite sample from all used solvents (Penetone 647 & TPC or 647/TPC Blend) prior to burning them in the boilers to verify the solvents are either non-hazardous or RCRA Part 111 conditionally exempt.² (R 336.1201(3))

2. When solvents are combusted in the boilers, the facility shall monitor and record the amount, in gallons, and type of used solvents combusted in the boilers during each calendar month.² (R 336.1201(3))
3. Applicant shall keep a monthly record of the usage rate, in gallons, of specification used oil burned as supplemental fuel.² (R 336.1201(3))
4. At least twice per calendar year or upon the request of the AQD, the facility shall collect and analyze a representative composite sample of all categories of the specification used oils used as supplemental fuel for Boilers 1-3, to verify the physical and chemical properties of the used oil comply with the specifications listed in Appendix 5. Samples shall be collected with sampling procedures and analytical techniques, including quality assurance procedures, acceptable to the Air Quality Division.¹ (R 336.1201(3))
5. The permittee shall calculate the CO emissions based on the monthly heat input from coal analysis/coal burned and an emission factor of 0.0208 lb CO/mmBtu. (R 336.1213(3))
6. The permittee shall monitor gas flow, opacity, SO₂, and NO_x emissions using CEMS, as installed, maintained, and operated in accordance with the provisions of 40 CFR Part 75.
7. For each precipitator, the permittee shall monitor and record the parameters included in the facility's "Precipitator Operation and Preventative Maintenance Plan." (R 336.1213(3))

See Appendix 3

VII. REPORTING

1. Prompt reporting of deviations pursuant to General Conditions 21 and 22 of Part A. (R 336.1213(3)(c)(ii))
2. Semiannual reporting of monitoring and deviations pursuant to General Condition 23 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for reporting period July 1 to December 31 and September 15 for reporting period January 1 to June 30. (R 336.1213(3)(c)(i))
3. Annual certification of compliance pursuant to General Conditions 19 and 20 of Part A. Report shall be postmarked or received by appropriate AQD district office by March 15 for the previous calendar year. (R 336.1213(4)(c))

See Appendix 8

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVBOILER1	132 ²	297 ²	R 336.1201(3)
2. SVBOILER2	132 ²	297 ²	R 336.1201(3)
3. SVBOILER3	142 ²	297 ²	R 336.1201(3)

IX. OTHER REQUIREMENT(S)

Section 1

ROP No: MI-ROP-B2846-2006

Expiration Date: June 2, 2011

PTI No: MI-PTI-B2846-2006

1. The permittee shall comply with the acid rain permitting provisions of 40 CFR 72 as outlined in a complete Phase II Acid Rain Permit issued by the AQD. Phase II Acid Rain Permit No. MI-AR-1723-200X is hereby incorporated into this ROP as Appendix 9. **(R 336.1299(d))**
2. The permittee shall not allow the emission of an air pollutant to exceed the amount of any emission allowances that an affected source lawfully holds as of the allowance transfer deadline pursuant to R 336.1299(d) and 40 CFR Part 72.9(c)(1)(i). **(R 336.1213(10))**
3. The permittee shall hold NOx allowances available for compliance deductions under 40 CFR Part 96.54 in the unit's compliance account and the source's overdraft account in an amount not less than the total NOx emissions for the control period from the unit. **(R336.1805, 40 CFR Part 96.6(c))**
4. The permittee shall comply with a NOx Budget Trading permitting provisions of 40 CFR Part 96.1 to 96.88, as adopted and as modified by Rules 802 to 816, as outlined in NOx Budget Trading permit Number MI-NOX-1723-200X issued by the AQD. The NOx Budget Trading permit is hereby incorporated into this ROP as **Appendix 10. (R 336.1802)**
5. Used solvents shall be generated on site and shall be either blended with the coal at or downstream of the reclaim hopper or injected into the boilers directly.² **(R 336.1201(3))**
6. Specification used oil is defined as used lubricating oils including turbine oil, mill oil, and miscellaneous small quantities of lubricating oils, generated at the Whiting plant and meeting the specifications shown in Appendix 5.² **(R 336.1201(3), R 336.1225)**

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

Attachment 2

**Excerpt from the Michigan AQD's "Technical Support Document – New Source
Review State Implementation Plan" pertaining to Rule 336.1285(z)**

ATTACHMENT H



STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

TECHNICAL SUPPORT DOCUMENT

NEW SOURCE REVIEW
STATE IMPLEMENTATION PLAN

August 26, 2003

285(x): Any asbestos removal or stripping process or process equipment.

The NESHAP, 40 CFR Part 61, Subpart M, contains regulations designed to prevent the emission of asbestos fibers to the outdoor air during specific demolition and/or renovation activities (primarily involving commercial and industrial facilities).

The MCIS administers the Asbestos Program. The primary function of the program is to assure that the people working with asbestos are properly trained and the individuals performing asbestos removal comply with rules governing the work activity. These rules are designed to protect not only the individual employee performing asbestos abatement work, but also the general public that occupy the area or building in which the work occurs.

The Asbestos Program is responsible for enforcement of the Asbestos Abatement Contractors Licensing Act (1986 PA 135, as amended), the Asbestos Workers Accreditation Act (1988 PA 440, as amended), and for meeting the state of Michigan's mandated responsibilities under the USEPA's Asbestos Hazard Emergency Response Act. The program also enforces asbestos issues related to the MIOSHA.

Currently, permits are not required for such activities. Because asbestos emissions are controlled through implementation of federal NESHAP regulations and the MCIS regulations, we recommend formal exemption of asbestos removal operations from the requirement to obtain a permit to install.

Rule 285(y): Ozonization process or process equipment.

Ozonization processes generate small amounts of ozone. Ozone is a colorless gas that is used to disinfect or deodorize a variety of air or water streams; however, it is an unstable oxygen compound that is highly reactive and breaks down quickly to form water and oxygen (H_2O and O_2). Although ozone is a criteria pollutant, sources of ozone are not regulated. Precursors of ozone include VOCs and NO_x , which combine in the presence of sunlight to produce ozone or smog. Reduction of ambient ozone concentrations is accomplished through the limitation of VOC emissions and the reduction of NO_x emissions.

The amount of ozone that is generated and may potentially be emitted to the atmosphere from an ozonization process will have no significant impact on atmospheric ozone concentration. Since it breaks down quickly, it does not affect the NAAQS and does not pose an environmental threat. The AQD regulates VOC and NO_x sources to indirectly regulate ambient ozone concentrations. Ozonization processes are not considered significant emission sources and should be exempt from the requirement to obtain a permit to install.

Rule 285(z): Combustion of boiler cleaning solutions that were solely used for or intended for cleaning internal surfaces of boiler tubes and related steam and water cycle components if the solution burned is not designated, by listing or specified characteristic, as hazardous pursuant to federal regulations or state rules.

In the course of normal operation, metal deposits (mostly copper and iron) are formed within the boiler tubes and heat exchangers of coal-fired steam boilers. These deposits cause impaired

unit efficiency and the boilers must periodically undergo a cleaning process to remove the iron and copper from the internal boiler tube surfaces. Ammoniated ethylene diamine tetraacetic acid (EDTA) has become the industry accepted standard for boiler cleaning, replacing the more harsh acting hydrochloric acid. The EDTA is circulated through the boiler tubes to remove the deposits, which are then drained from the boiler tubes along with the spent EDTA. The EDTA is not exhausted to the atmosphere during the boiler cleaning process.

Gradual evaporation of the drained boiler cleaning solution is done by spraying the solution into the boiler, through temporary nozzles at the high temperature flame zone above the burners. The solution is incinerated when the boiler is at normal operating temperature and pressure. During incineration of the boiler cleaning solution, the EDTA will decompose to nitrogen (N₂), carbon dioxide (CO₂), and water (H₂O) vapor and the various metals will be chemically transformed and liberated upon combustion as metallic oxides (particulates). Tests indicate that less than 1% of copper and iron are emitted in the fume state. The metallic oxides react in a manner similar to coal ash and are either collected by the control equipment or are combined with the bottom ash and are disposed of in the same manner as the coal ash. Since the metallic oxides will not be dissolved, the metals will not dissociate into the environment, making this method of disposal environmentally acceptable.

Several permits issued by the AQD show that emissions from the boiler cleaning process are not significant. In all cases the emissions were determined to be environmentally acceptable. Permit conditions included limits on particulate, amount of solution sprayed and burn period, and the requirement to operate the control device during incineration of the boiler cleaning solution. The following table shows the level of emissions from this process at various burn rates.

Feed Rate (gpm)	Burn Period (hours)	Controlled Emissions (pounds/hour)			
		Fe ₂ O ₃	Copper	Nickel	Zinc
83	10	0.09	0.30	0.32	0.04
120	6.5	3.80	0.62	0.23	0.12
200	6.2	1.29	3.48	1.7	0.04
250	6-10	3.26	1.09	1.38	0.18
250	6-10	3.72	3.19	3.5	0.45

Staff have previously evaluated this process and determined that the cleaning process does not result in a quantifiable increase in emissions. Provided that the resulting solution to be burned is not a hazardous waste, the combustion of boiler cleaning solutions is not considered a significant source of emissions and should be exempt from the requirement to obtain a permit to install.

Rule 285(aa): Landfills and associated flares and leachate collection and handling equipment.

Municipal solid waste (MSW) landfills, used to dispose solid wastes, currently go through a very extensive permitting process under Part 115, Solid Waste Management, of Act 451. As part of the application, the applicant needs to specifically address the need for other permits that may be required under other parts of Act 451, including Part 55, Air Pollution Control. Specifically,

Attachment 3

Copies of Michigan AQD Rules 336.1201, 336.1278 and 336.1285

R 336.1201 Permits to install.

Rule 201. (1) Except as allowed in R 336.1202 or R 336.1278 to R 336.1290, a person shall not install, construct, reconstruct, relocate, or modify any process or process equipment, including control equipment pertaining thereto, which may emit any of the following, unless a permit to install which authorizes such action is issued by the department:

(a) Any air pollutant regulated by title I of the clean air act and its associated rules, including 40 C.F.R. §§51.165 and 52.21.

(b) Any air contaminant.

A person who plans to install, construct, reconstruct, relocate, or modify any such process or process equipment shall apply to the department for a permit to install on an application form approved by the department and shall provide the information required in R 336.1203.

(2) The department may issue a permit to install for any of the following reasons:

(a) To authorize a person to install, construct, reconstruct, relocate, or modify a process or process equipment pursuant to subrule (1)(a) of this rule.

(b) To establish limits on potential to emit. The limits shall comply with the provisions of R 336.1205(1)(a).

(c) To consolidate terms and conditions from existing permits to install within a renewable operating permit pursuant to R 336.1214a.

(d) To authorize a person to install, construct, reconstruct, relocate, or modify process or process equipment solely pursuant to subrule (1)(b) of this rule or to consolidate state-only enforceable conditions within a renewable operating permit when the renewable operating permit is issued pursuant to R 336.1214. This permit may establish terms and conditions that are legally enforceable solely pursuant to R 336.1224 to R 336.1232, R 336.1901, or other regulations that are not federally enforceable. Each condition in a permit issued pursuant to this subrule shall be identified as state-only enforceable.

(3) A permit to install may be approved subject to any condition, specified in writing, that is reasonably necessary to assure compliance with all applicable requirements.

(4) If a person decides not to install, construct, reconstruct, relocate, or modify the process or process equipment as authorized by a permit to install, then the person, or the authorized agent pursuant to R 336.1204, shall notify the department, in writing, and upon receipt of the notification by the department, the permit to install shall become void. If the installation, reconstruction, or relocation of the equipment, for which a permit has been issued, has not commenced within, or has been interrupted for, 18 months, then the permit to install shall become void, unless otherwise authorized by the department as a condition of the permit to install.

(5) Upon issuance of a permit to install, the emissions from the process or process equipment allowed by the permit to install shall be included in the potential to emit of the stationary source. Upon the physical removal of the process or process equipment, or upon a determination by the department that the process or process equipment has been permanently

shut down, the permit to install shall become void and the emissions allowed by the permit to install shall no longer be included in the potential to emit of the stationary source.

(6) Except as provided in subrule (8) of this rule and R 336.1216, operation of the process or process equipment is allowed by the permit to install. The department may void a permit to install upon any of the following actions:

(a) A new permit to install authorizing the action is approved by the department in accordance with subrule (2)(a), (b), or (d) of this rule, and the new permit to install renders all portions of the old permit obsolete.

(b) All terms and conditions of the permit to install are incorporated into a renewable operating permit, in accordance with the provisions of R 336.1212(5) and R 336.1213, and a source-wide permit to install is issued pursuant to R 336.1214a.

(c) All of the emission units, processes, or process equipment covered by the permit to install are physically removed from the stationary source or the department makes a determination that the emission units, processes, or process equipment covered by the permit to install have been permanently shut down.

(7) The department may require 1 or both of the following notification requirements as a condition of a permit to install:

(a) Not more than 30 days after completion of the installation, construction, reconstruction, relocation, or modification authorized by the permit to install, unless a different period is specified in the permit to install, the person to whom the permit to install was issued, or the authorized agent pursuant to R 336.1204, shall notify the department, in writing, of the completion of the activity. Completion of the installation, construction, reconstruction, relocation, or modification is considered to occur not later than commencement of trial operation of the process or process equipment.

(b) Within 12 months after completion of the installation, construction, reconstruction, relocation, or modification authorized by the permit to install, or 18 months after the effective date of this rule, whichever is later, unless a different period is specified in the permit to install, the person to whom the permit to install was issued, or the authorized agent pursuant to R 336.1204, shall notify the department, in writing, of the status of compliance of the process or process equipment with the terms and conditions of the permit to install. The notification shall include all of the following:

(i) The results of all testing, monitoring, and recordkeeping performed by the stationary source to determine the actual emissions from the process or process equipment and to demonstrate compliance with the terms and conditions of the permit to install.

(ii) A schedule of compliance for the process or process equipment.

(iii) A statement, signed by the person owning or operating the process or process equipment, that, based on information and belief formed after reasonable inquiry, the statements and information in the notification are true, accurate, and complete.

(8) If evidence indicates that the process or process equipment is not performing in accordance with the terms and conditions of the permit to install, the department, after notice

and opportunity for a hearing, may revoke the permit to install consistent with section 5510 of the act. Upon revocation of the permit to install, operation of the process or process equipment shall be terminated. Revocation of a permit to install is without prejudice and a person may file a new application for a permit to install that addresses the reasons for the revocation.

History: 1979 ACS 1, Eff. Jan. 19, 1980; 1992 MR 4, Eff. Apr. 17, 1992; 1995 MR 7, Eff. July 26, 1995; 1996 MR 11, Eff. Dec. 12, 1996; 2003 MR 12, Eff. July 1, 2003.

R 336.1278 Exclusion from exemption.

Rule 278. (1) The exemptions specified in R 336.1280 to R 336.1290 do not apply to either of the following:

(a) Any activity that is subject to 40 C.F.R. §52.21, prevention of significant deterioration regulations, or R 336.1220, nonattainment new source review regulations.

(b) Any activity that results in an increase in actual emissions greater than the significance levels defined in R 336.1119.

For the purpose of this rule, "activity" means the concurrent and related installation, construction, reconstruction, relocation, or modification of any process or process equipment.

(2) The exemptions specified in R 336.1280 to R 336.1290 do not apply to the construction of a new major source of hazardous air pollutants or reconstruction of a major source of hazardous air pollutants, as defined in and subject to 40 C.F.R. §63.2 and §63.5(b)(3), national emission standards for hazardous air pollutants.

(3) The exemptions specified in R 336.1280 to R 336.1290 do not apply to a construction or modification as defined in and subject to 40 C.F.R. part 61, national emission standards for hazardous air pollutants.

(4) The exemptions in R 336.1280 to R 336.1290 apply to the requirement to obtain a permit to install only and do not exempt any source from complying with any other applicable requirement or existing permit limitation.

History: 1993 MR 11, Eff. Nov. 18, 1993; 1994 MR 2, Eff. Mar. 31, 1994; 1995 MR 7, Eff. July 26, 1995; 1996 MR 11, Eff. Dec. 12, 1996; 1997 MR 7, Eff. June 15, 1997; 1998 MR 6, Eff. July 2, 1998; 2003 MR 12, Eff. July 1, 2003.

R 336.1285 Permit to install exemptions; miscellaneous.

Rule 285. The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following:

(a) Routine maintenance, parts replacement, or other repairs that are considered by the department to be minor, or relocation of process equipment within the same geographical site not involving any appreciable change in the quality, nature, quantity, or impact of the emission of an air contaminant therefrom. Examples of parts replacement or repairs considered by the department to be minor include the following:

- (i) Replacing bags in a baghouse.
- (ii) Replacing wires, plates, rappers, controls, or electric circuitry in an electrostatic precipitator which does not measurably decrease the design efficiency of the unit.
- (iii) Replacement of fans, pumps, or motors which does not alter the operation of a source or performance of air pollution control equipment.
- (iv) Boiler tubes.
- (v) Piping, hoods, and ductwork.
- (vi) Replacement of engines, compressors, or turbines as part of a normal maintenance program.

(b) Changes in a process or process equipment which do not involve installing, constructing, or reconstructing an emission unit and which do not involve any meaningful change in the quality and nature or any meaningful increase in the quantity of the emission of an air contaminant therefrom. Examples of such changes in a process or process equipment include the following:

- (i) Change in the supplier or formulation of similar raw materials, fuels, or paints and other coatings.
- (ii) Change in the sequence of the process.
- (iii) Change in the method of raw material addition.
- (iv) Change in the method of product packaging.
- (v) Change in process operating parameters.
- (vi) Installation of a floating roof on an open top petroleum storage tank.
- (vii) Replacement of a fuel burner in a boiler with an equally or more thermally efficient burner.
- (viii) Lengthening a paint drying oven to provide additional curing time.

(c) Changes in a process or process equipment which do not involve installing, constructing, or reconstructing an emission unit and which involve a meaningful change in the quality and nature, or a meaningful increase in the quantity, of the emission of an air contaminant resulting from any of the following:

- (i) Changes in the supplier or supply of the same type of virgin fuel, such as coal, no. 2 fuel oil, no. 6 fuel oil, or natural gas.
- (ii) Changes in the location, within the storage area, or configuration of a material storage pile or material handling equipment.
- (iii) Changes in a process or process equipment to the extent that such changes do not alter the quality and nature, or increase the quantity, of the emission of the air contaminant beyond the level

which has been described in and allowed by an approved permit to install, permit to operate, or order of the department.

(d) Reconstruction or replacement of air pollution control equipment with equivalent or more efficient equipment.

(e) Installation, construction, or replacement of air pollution control equipment for an existing process or process equipment for the purpose of complying with the national emission standards of hazardous air pollutants regulated under section 112 of part A of title I of the clean air act, 84 Statutes 1685, 42 U.S.C. §7412.

(f) Installation or construction of air pollution control equipment for an existing process or process equipment if the control equipment itself does not actually generate a significant amount of criteria air contaminants as defined in R 336.1119(e) or a meaningful quantity of toxic air contaminants.

(g) Internal combustion engines that have less than 10,000,000 Btu/hour maximum heat input.

(h) Vacuum pumps in laboratory or pilot plant operations.

(i) Brazing, soldering, welding, or plasma coating equipment.

(j) Portable cutting torches.

(k) Grain, metal, or mineral extrusion presses.

(l) The following equipment and any exhaust system or collector exclusively serving the equipment:

(i) Equipment used exclusively for bending, forming, expanding, rolling, forging, pressing, drawing, stamping, spinning, or extruding either hot or cold metals.

(ii) Die casting machines.

(iii) Equipment for surface preparation of metals by use of aqueous solutions, except for acid solutions.

(iv) Atmosphere generators used in connection with metal heat treating processes.

(v) Equipment used exclusively for sintering of glass or metals, but not exempting equipment used for sintering metal-bearing ores, metal scale, clay, flyash, or metal compounds.

(vi) Equipment for carving, cutting, routing, turning, drilling, machining, sawing, surface grinding, sanding, planing, buffing, sand blast cleaning, shot blasting, shot peening, or polishing ceramic artwork, leather, metals, plastics, concrete, rubber, paper stock, wood, or wood products which meets any of the following:

(A) Equipment used on a nonproduction basis.

(B) Equipment has emissions that are released only into the general in-plant environment.

(C) Equipment has externally vented emissions controlled by an appropriately designed and operated fabric filter collector that, for all specified operations with metal, is preceded by a mechanical precleaner.

(vii) Photographic process equipment by which an image is reproduced upon material sensitized to radiant energy, including any of the following:

(A) Blueprint machines.

(B) Photocopiers.

(C) Mimeograph machines.

(D) Photographic developing processes.

(E) Microfiche copiers.

- (viii) Battery charging operations.
- (ix) Pad printers.
- (m) Lagoons, process water treatment equipment, wastewater treatment equipment, and sewage treatment equipment, except for any of the following:
 - (i) Lagoons and equipment primarily designed to treat volatile organic compounds in process water, wastewater, or groundwater, unless the emissions from the lagoons and equipment are only released into the general in-plant environment.
 - (ii) Sludge incinerators and dryers.
 - (iii) Heat treatment processes.
 - (iv) Odor control equipment.
- (n) Livestock and livestock handling systems from which the only potential air contaminant emission is odorous gas.
- (o) Equipment for handling and drying grain on a farm.
- (p) Commercial equipment used for grain unloading, handling, cleaning, storing, loading, or drying in a column dryer that has a column plate perforation of not more than 0.094 inch or a rack dryer in which exhaust gases pass through a screen filter no coarser than 50 mesh.
- (q) Portable steam deicers that have a heat input of less than 1,000,000 Btu's per hour.
- (r) Equipment used for any of the following metal treatment processes if the process emissions are only released into the general in-plant environment:
 - (i) Surface treatment.
 - (ii) Pickling.
 - (iii) Acid dipping.
 - (iv) Cleaning.
 - (v) Etching.
 - (vi) Electropolishing.
 - (vii) Electrolytic stripping or electrolytic plating.
- (s) Emissions or airborne radioactive materials specifically authorized pursuant to a United States nuclear regulatory commission license.
- (t) Equipment for the mining and screening of uncrushed native sand and gravel.
- (u) Solvent distillation equipment that has a rated batch capacity of not more than 55 gallons.
- (v) Any vapor vacuum extraction soil remediation process where vapor is treated in a control device and all of the vapor is reinjected into the soil such that there are no emissions to the atmosphere during normal operation.
- (w) Air strippers controlled by an appropriately designed and operated carbon adsorption or incineration system that is used exclusively for the cleanup of gasoline, fuel oil, natural gas condensate, and crude oil spills.
- (x) Any asbestos removal or stripping process or process equipment.
- (y) Ozonization process or process equipment.

(z) Combustion of boiler cleaning solutions that were solely used for or intended for cleaning internal surfaces of boiler tubes and related steam and water cycle components if the solution burned is not designated, by listing or specified characteristic, as hazardous pursuant to federal regulations or state rules.

(aa) Landfills and associated flares and leachate collection and handling equipment.

(bb) A residential, municipal, commercial, or agricultural composting process or process equipment.

(cc) Gun shooting ranges controlled by appropriately designed and operated high-efficiency particulate filters.

(dd) Equipment for handling, conveying, cleaning, milling, mixing, cooking, drying, coating, and packaging grain-based food products and ingredients which meet any of the following:

(i) Equipment used on a nonproduction basis.

(ii) Equipment has emissions that are released only into the general in-plant environment.

(iii) Equipment has externally vented emissions controlled by an appropriately designed and operated particulate control system.

(ee) Open burning.

(ff) Fire extinguisher filling, testing, spraying, and repairing.

(gg) Equipment used for chipping, flaking, or hogging wood or wood residues that are not demolition waste materials.

(hh) A process that uses only hand-held aerosol spray cans, including the puncturing and disposing of the spray cans.

(ii) Fuel cells that use phosphoric acid, molten carbonate, proton exchange membrane, or solid oxide or equivalent technologies.

(jj) Any vacuum truck used at a remediation site as a remedial action method, if it is not used more than once per month at a site and the usage is not more than 2 consecutive days.

(kk) Air sparging systems where the sparged air is emitted back to the atmosphere only by natural diffusion through the contaminated medium and covering soil or other covering medium.

(ll) Air separation or fractionation equipment used to produce nitrogen, oxygen, or other atmospheric gases.

History: 1979 ACS 1, Eff. Jan. 19, 1980; 1992 MR 4, Eff. Apr. 17, 1992; 1993 MR 11, Eff. Nov. 18, 1993; 1995 MR 7, Eff. July 26, 1995; 1997 MR 5, Eff. June 15, 1997; 2003 MR 12, Eff. July 1, 2003.

The logo for Consumers Energy, featuring the company name in a bold, sans-serif font, with a stylized swoosh or arc above the text.

A CMS Energy Company

Environmental & Lab Services
1945 West Parnall Road
Jackson, MI 49201-8643

Fax: 517 788 2329

January 11, 2002

Ms. Heidi Hollenbach
Michigan Department of Environmental Quality
Air Quality Division
State Office Building, 6th Floor
350 Ottawa Avenue, NW
Grand Rapids, MI 49503

Re: Construction Waiver, J H Campbell 2 & 3 SCR Installation

Dear MS. Hollenbach,

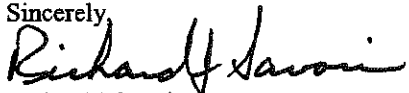
SRN: B2835

On November 6, 2001, an air use application (337-01) was submitted to the Lansing Permit Section to request a pollution control project Permit to Install for the Consumers Energy Company J H Campbell Plant for installation of Selective Catalytic Reduction systems (NOx removal) on Units 2 and 3. Pursuant to Rule 202, this letter is to request a waiver to allow construction to begin prior to the issuance of the Permit to Install to avoid an undue hardship due to the delay of the construction.

The construction of the Unit 3 SCR is scheduled to start in early March 2002 and Unit 2 will start in July 2002. This is an extensive project with the completion and startup of the SCR systems scheduled for late 2003-04 with continued operation in the 2004 ozone season. A recent discussion with David Ferrier of the Lansing Permit Unit indicated that the permit might not be issued prior to this schedule due to an extensive backlog of applications in his area. Also note that this project is exempt from Federal New Source Review as a pollution control project, and is therefore eligible for a Rule 202 waiver.

Please contact me at 517-788-0098 if you require any additional information to process this waiver request.

Sincerely,

A handwritten signature in dark ink, appearing to read "Richard J. Savoie".

Richard J Savoie
Senior Environmental Planner
Consumers Energy

CC David Ferrier, MDEQ-Lansing
WM Ritchie, Campbell 3 (Responsible Official)
WL Beckman, P-22-508A
AF Goodman, M-1041
AK Evans, P-22-535A

BCC KPMeigh, H-1025
RLOliver, H-1012
DEKnottnerus, Campbell Title I
GAHunt, Campbell Title I
File 1EP02.2
File 83EP02.2



A CMS Energy Company

Environmental & Lab Services
1945 West Parnall Road
Jackson, MI 49201-8643

Fax: 517 788 2329

January 22, 2002

Ms. Heidi Hollenbach
Michigan Department of Environmental Quality
Air Quality Division
State Office Building, 6th Floor
350 Ottawa Avenue, NW
Grand Rapids, MI 49503

Re: Construction Waiver, J H Campbell 2 & 3 SCR Installation

Dear MS. Hollenbach,

SRN: B2835

Per your instruction, enclosed is the signed original construction waiver for the SCR installation at Consumers Energy Company JHCampbell Plant. We thank you for your quick attention to this matter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Richard J. Savoie".

Richard J Savoie
Senior Environmental Planner
Consumers Energy

CC David Ferrier, MDEQ-Lansing
JERRY Johnson, MDEQ-Lansing
John W. Ritchie, Campbell 3 (Responsible Official)
WLBeckman, P-22-508A
AFGoodman, M-1041
AKEvans, P-22-535A

BCC KPM Leigh, H-1025
RLOliver, H-1012
DEKnottnerus, Campbell Title I
GAHunt, Campbell Title I
File 1EP02.2
File 83EP02.2



JOHN ENGLER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
GRAND RAPIDS DISTRICT OFFICE



RUSSELL J. HARDING
DIRECTOR

January 18, 2002

Mr. Richard J. Savoie
Consumers Energy
1945 West Parnall Road
Jackson, MI 49201-8643

Dear Mr. Savoie:

SUBJECT: Construction Waiver, J.H. Campbell Units 2 and 3

The Department of Environmental Quality (DEQ), Air Quality Division (AQD), proposes to approve your request received January 15, 2002, for a waiver of the permit requirements to allow Consumers Energy, J.H. Campbell Plant to begin installation of selective catalytic reduction (SCR) systems for Units 2 and 3 to be located at 17000 Croswell, West Olive, Michigan, prior to final action on Permit to Install Application No. 337-01. Approval of this waiver request is contingent upon your agreement to the conditions described below as indicated by the return of this letter, signed and dated.

You are hereby notified that this approval is based upon and subject to your agreement of the following conditions:

1. All construction commenced prior to the issuance of a Permit to Install is entirely at the applicant's own risk. The AQD has not conducted a review of the application sufficient to determine whether the proposed source will comply with state and federal air quality regulations. Therefore, any costs required to modify a building or process or control equipment which was installed pursuant to this waiver will not be taken into account in determining the appropriate level of control of air contaminant emissions.
2. Issuance of this waiver in no way is intended to imply the proposed action can or will be approved.
3. No construction beyond the aforementioned is allowed prior to final action on the Permit to Install.
4. No trial operation of the proposed process or process equipment is allowed prior to final action on the Permit to Install.
5. Approval of this waiver does not relieve Consumers Energy, J.H. Campbell Plant from responsibility for any installation or operation that has occurred or may occur without issuance of necessary air use permits or other authorizations, or has occurred or may occur in non-compliance with such permits, regulations, or other requirements. Furthermore, approval of this waiver in no way precludes the State of Michigan from initiating enforcement action for any such violations.

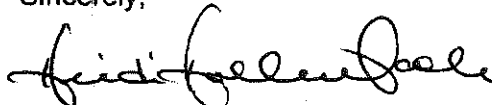
Mr. Richard J. Savoie
Consumers Energy
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January 18, 2002

6. Federal Prevention of Significant Deterioration (PSD) rules do not allow construction waivers for any source subject to PSD regulations, being 40 CFR 52.21. By accepting this waiver, applicant agrees and certifies the subject source in the application is not subject to regulation under 40 CFR 52.21.
7. The National Emission Standards for Hazardous Air Pollutants for Source Categories, Subpart B - Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Section 112(g), 40 CFR 63.40 through 63.44, prohibits commencement of construction prior to a determination of Maximum Achievable Control Technology. By accepting this waiver, applicant agrees and certifies the subject source in the application is not subject to regulation under 40 CFR 63.40 through 63.44.
8. This waiver may be terminated by written notification from the Chief, DEQ, AQD, at any time. Furthermore, all authorizations granted by this waiver are terminated if the Permit to Install application is denied.

If you agree to the conditions of this waiver, as noted above, sign and date below and return the original letter to me, keeping a copy for your records. The waiver is approved only upon our receipt of the signed letter.

Please contact me at the telephone number below if you have any questions concerning this matter.

Sincerely,



Heidi G. Hollenbach
Grand Rapids District Supervisor
Air Quality Division
616-356-0243

HGH:KO

cc: Mr. Gerald Avery, Field Operations Supervisor, AQD
Ms. Lynn Fiedler, Permit Section Supervisor, AQD

Mr. Richard J. Savoie
Consumers Energy
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January 18, 2002


As an authorized representative of Consumers Energy, I accept this waiver and understand and agree to all conditions described above.

W. Stehman
NAME:
Mgr. Environmental & Lab Service
TITLE:
Jan 22, 2002
DATE:

Return signed original to:

Heidi G. Hollenbach
Department of Environmental Quality
Air Quality Division
350 Ottawa N.W., Unit 10
Grand Rapids, MI 49503

Consumers Energy Memorandum

To: SWDuga, Campbell 1&2
From: RJSavoie, P-22-512 
Date: June 10, 2002
Subject: Campbell 2 & 3 SCR Permit to Install

CC: AKEvans, P-22-535A (w/o Attach)
JPPomaranski, Campbell Title I (w/o Attach)
RLOliver, H-1012 (w/o Attach)
Campbell Permit File

Attached is the permit to install for the Selective Catalytic Reductions systems on Campbell 2 & 3. This permit contains the tables for the Renewable Operating Permit (ROP) for each boiler. There were no additional requirements added to these table associated with the installation of the SCRs. The only change was the addition of SCRs to the pollution control equipment descriptions contained in each table.

There are no additional record-keeping requirements associated with this permit. We are required to notify MDEQ within 30 days after completion of the installation and to incorporate this permit into the Renewable Operating Permit within 12 months following this notification. We maintain a list of all issued permits for the company with required actions and their completion. This permit will be added to that list and we will make inquiries to the appropriate people as to the project completion status nears the expected completion time frame.

If you have any question, contact me at 80098.



A CMS Energy Company

January 23, 2008

Mr. Chris Hare
Assistance District Supervisor
Michigan Department of Environmental Quality
Lansing District Office
525 West Allegan Street
4th Floor North
Lansing, Michigan 48933

Mr. Mark Reed
District Supervisor
Michigan Department of Environmental Quality
Saginaw Bay District Office
503 N. Euclid Ave.
Bay City, Michigan, 48706-2965

**RE: Installation of Air Pollution Control Equipment – Karn/Weadock
Michigan Rule 278a Exemption Demonstration**

Dear Mr. Hare and Mr. Reed:

I wanted to take a moment to thank you and the Michigan Department of Environmental Quality (MDEQ) Saginaw Bay District staff for meeting with us on December 20, 2007 and subsequently on January 14, 2008 to discuss the new air pollution control equipment Consumers Energy Company (“Consumers”) is planning on installing at the Karn/Weadock Generating Station, located in Hampton Township, Bay County, MI.

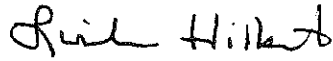
I hope the meeting helped you understand the details of the pollution control projects and the type of emissions reductions expected. As discussed in the meeting, both Consumers and the MDEQ believe that these projects are exempt from permitting requirements. However, you asked that we submit a Michigan Rule 278a Exemption demonstration for review.

Attached is that demonstration. Once you have reviewed the document, we would like to obtain your written concurrence with the demonstration for our future reference as necessary. We note that this demonstration contains an “actuals to projected actuals” PSD applicability determination and should also satisfy any reporting requirements of R 336.2818(3) which may apply.

Mr. William Presson
October 8, 2007
Page 2

If you should have any questions or require any further information, please contact me
517-788-0044.

Sincerely,



Linda M. Hilbert, P.E.
Consumers Energy

cc. Mary Ann Dolehanty, MDEQ

Attachment

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
January 23, 2008**

I. INTRODUCTION

Any facility that operates a source of air pollution that is exempt under the provisions of Rules 280 through 290 is required to demonstrate the applicability of the exemption upon request of the MDEQ per R336.1278a.

This demonstration shows that, pursuant to R336.1285(d)&(f) and R336.284(k), the installation of air pollution control equipment on four (4) units at the Karn/Weadock Complex is eligible for exemption from the requirement of R336.1201 for a permit to install.

II. SITE DESCRIPTION

The Karn/Weadock Complex (SRN B2840) is located at 2742 North Weadock Highway in Hampton Township, Michigan in northern Bay County. The facility sits at the mouth of the Saginaw River along the shores of Saginaw Bay and encompasses approximately 2400 total acres. The Karn/Weadock Complex is one contiguous site consisting of three (3) distinct power plants: the 310 MW Weadock 7 and 8 plant; the 511 MW Karn 1 and 2 plant; and the 1,276 MW Karn 3 and 4 plant. Both the Weadock 7 and 8 plant and Karn 1 and 2 plant consist of coal-fired boilers while the Karn 3 and 4 plant consist of natural gas and oil co-fired boilers. Together, the six units at the Karn/Weadock Complex have the capacity to generate up to 2,097 MW.

III. RULE 278a DEMONSTRATION

The following demonstrates pursuant to R336.1278a that the project consisting of the four (4) air quality control systems (AQCS) which include fabric filter, activated carbon injection, and sorbent injection (FF/ACI/SI) systems are eligible for exemption from the air use-permitting requirement in R336.1201. The demonstration is organized consistent with R336.1278a(1)(a), (b), and (c) and includes the following information:

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
January 23, 2008**

A. "A description of the exempt process or process equipment, including the date of installation." - Rule 278a(1)(a)

Each AQCS will provide additional control for existing emissions by injecting sorbents (including activated carbon) into each respective exhaust stream, so that the sorbents may adhere to or react with various gaseous pollutants, like mercury and/or SO₂, and then filtering out the sorbent/pollutant material through the use of fabric filters.

Each AQCS will consist of a fabric filter, activated carbon storage and injection (ACI), and sodium bicarbonate (or an equivalent sorbent) storage and injection (SI) on each of the following units: D. E. Karn 1 and 2 (DEK-1 and DEK-2, or DEK 1&2), J. C. Weadock 7 and 8 (JCW-7 and JCW-8, or JCW 7&8). This includes new induced draft (I.D.) fans for each unit to overcome the increased pressure drop from the fabric filters, and four (4) ACI storage silos and four (4) SI storage silos. The fans will be sized to deliver the same air flow as required by the current heat input limits, which is consistent with measured air flow from recent stack tests. The new material storage silos will have fan assisted bin vent filters with design flow rates of 1,500 ACFM each.

Consumers Energy plans to begin construction on the FF/ACI/SI systems in spring 2008. The expected dates when the systems will be operating are presented in Table 1.

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
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Table 1. Expected Dates of Operation

UNIT	TECHNOLOGY	OPERATION DATE
DEK-1	Fabric Filter	1/1/2010
	Activated Carbon	1/1/2010
	Sorbent	7/1/2012
DEK-2	Fabric Filter	4/1/2010
	Activated Carbon	4/1/2010
	Sorbent	1/1/2013
JCW-7	Fabric Filter	1/1/2010
	Activated Carbon	1/1/2010
	Sorbent	1/1/2010
JCW-8	Fabric Filter	1/1/2010
	Activated Carbon	1/1/2010
	Sorbent	1/1/2010

**B. "The specific exemption being used by the process or process equipment." -
Rule 278a(1)(b)**

To accomplish the goal of controlling existing pollutants in each exhaust gas stream from each EGU, three types of physical process changes are necessary for each respective EGU:

1. Installation of activated carbon and other sorbent storage silos (i.e. storage silos for the ACI and SI). Eligible for exemption under R336.1284(k).
2. Installing equipment that will inject activated carbon and other sorbents into each exhaust stream for the purpose of controlling existing mercury and SO₂ emissions. Eligible for exemption under R336.1285(f).
3. Replacing the existing electrostatic precipitators with fabric filter baghouses to increase the existing particulate matter removal capacity to accommodate the removal of the

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
January 23, 2008**

sorbent and pollutants from the exhaust stream. Eligible for exemption under R336.1285(d).

a. *Storage silos / Rule 284(k)*

The installation of the new activated carbon and sodium bicarbonate or equivalent sorbent storage silos is eligible for exemption under Rule 284(k) which states:

Except as specified in R 336.1278, the requirement of R 336.1201(1) to obtain a permit to install does not apply to containers, reservoirs, or tanks used exclusively for any of the following:

* * *

(k) Storage containers of noncarcinogenic solid material, including silos, which only emit particulate matter and which are controlled with an appropriately designed and operated fabric filter collector system or an equivalent control system.

Activated carbon, sodium bicarbonate and related sorbents are noncarcinogenic solid materials and the silos will be equipped with fabric filters. The only emissions expected from each silo will be particulate emissions associated with loading or emptying, and these emissions will be controlled by an appropriately designed bin vent fabric filter. The size, designed emission rate and expected emissions for each bin vent fabric filter are listed in Subsection C.a(2) below.

b. *Activated Carbon Injection and Sorbent Injection / Rule 285(f)*

The installation of equipment that will inject activated carbon and sodium bicarbonate or equivalent sorbent into each exhaust stream is eligible for exemption under Rule 285(f) which states:

The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following:

* * *

Installation or construction of air pollution control equipment for an existing process or process equipment if the control equipment itself does not actually generate a significant amount of criteria air

**Michigan Rule 278a Exemption Demonstration
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contaminants as defined in R 336.1119(e) or a meaningful quantity
of toxic air contaminants.

Each EGU for which a FF/ACI/SI pollution control system is proposed (i.e. DEK-1, DEK-2, JCW-7, and JCW-8) is an existing emission unit. The injection equipment itself will not generate significant emissions of criteria air contaminants or a meaningful quantity of toxic air contaminants. Indeed, due to the installation of fabric filters on the existing boilers, there will likely be no measurable emissions from the injection equipment.

- c. *Replacement of existing electrostatic precipitators with new fabric filters / Rule 285(d)*

The installation of each new fabric filter and associated ID fan system is eligible for exemption under R336.1285(d) which states:

The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following:

* * *

- (d) Reconstruction or replacement of air pollution control equipment with equivalent or more efficient equipment.

Each new fabric filter and associated ID fan system will replace the existing electrostatic precipitators (ESP) for its respective EGU. After the new fabric filters are installed and operational, the existing ESPs will be removed from service. Replacing the current ESP with fabric filter control systems will result in lower filterable particulate emission rates. The expected vendor guarantee based on initial discussions is 0.015 lb/MMBtu PM, Filt, which is less than the baseline emission rates from each ESP as shown in Table 3.

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
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C. "An analysis demonstrating that R 336.1278 does not apply to the process or process equipment." - Rule 278a(1)(c)

The following analysis demonstrates that R336.1278 does not exclude the process or process equipment from otherwise being eligible for exemption. The analysis is organized according to the individual subparts of Rule 278.

- a. *Rule 336.1278(1)(a) and (b) – Demonstration that the proposed project(s) are not subject to PSD and will not result in an increase in actual emissions of a criteria pollutant that is greater than the respective significance level.*

As shown below, the installation of the four FF/ACI/SI control systems will not be subject to the PSD regulations nor result in an increase in actual emissions greater than the R336.1119 significance levels. The analysis that follows is based on considering this project independent of both the Advanced Supercritical Pulverized Coal-fired (ASCPC) boiler project and the low NO_x burner project for JCW 7&8. The technical and economic independence of this project is discussed in Attachment 1.

- (1) The combined emissions change of each criteria pollutant from DEK 1&2 and JCW 7&8 that will occur as a result of the installation of the FF/ACI/SI pollution control system for each emission unit will be less than the respective significant level for each criteria pollutant.

To determine if the proposed project would be considered a major modification as defined in the PSD regulations, an "Actual-to-projected-actual applicability test" was performed in accordance with R336.12802(4)(c). The Baseline Actual Emissions (BAE) were first determined as the average rates the four boilers (and appropriate ancillary operations) actually emitted, in tons per year, calculated over a consecutive 24-month period. The projection period for the project was determined as 5 years from the date that the project resumes regular operation, as the project will not increase the design capacity or potential to emit of any of the associated emission units.

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Over the projection period, both Projected Actual Emissions (PAE) and Excludable Emissions (EE) were then calculated based upon forecasted utilization with and without the project. The Emissions Change due to the project was then calculated as the difference between the PAE and the higher of the BAE or EE.

As shown in Table ¹²9, the Emissions Change for each pollutant resulting from this project is less than the respective PSD significance level. Thus, the project is not a major modification under the PSD rules. Since the R336.1119 significant levels are identical to the PSD levels, the project also meets the requirements of R336.1278(1)(b).

The following tables contain the raw data and the results of the calculations performed to determine the aggregate change in emissions of each criteria pollutant associated with the injection of activated carbon and sodium bicarbonate or equivalent sorbent into the exhaust streams from DEK 1&2 and JCW 7&8:

- (a) Table 2 presents a summary of the combined baseline emissions from DEK 1&2 and JCW 7&8. The particulate matter baseline emission rates include those associated with coal and ash handling, calculated consistent with historic Michigan Air Emissions Reporting System (MAERS) submittals.

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Table 2. Baseline Pollutant Emissions

NSR Pollutants	Emissions (tons)	Period	Heat Input (MMBtu)
CO	733.8	Aug-04 to Jul -06	62,710,937
NO _x	8,527.4	Jun-03 to May-05	60,327,046
SO ₂	27,520.0	Feb-05 to Jan-07	61,451,047
VOC	88.1	Aug-04 to Jul -06	62,710,937
Lead	0.61	Aug-04 to Jul -06	62,710,937
PM, Total	1,736.1	May-05 to Apr-07	61,576,447
PM ₁₀ , Total	1,324.6	May-05 to Apr-07	61,576,447
PM _{2.5} , Total	901.0	May-05 to Apr-07	61,576,447

The total particulate emissions is a summation of the particulate emissions from the boilers (both filterable and condensable) as well as those associated with coal and ash handling, calculated consistent with prior MAERS submittals. The individual breakdown of the particulate emissions is shown in the following table.

Table 3. Breakdown of Baseline Particulate Emission Rates

Particulate Source	Emission Rate (tons per year)
Boiler PM, Filt	1,114.6
Boiler PM ₁₀ , Filt	746.8
Boiler PM _{2.5} , Filt	323.2
Boiler PM, Cond	553.4
Boiler PM, Total	1,668.0
Boiler PM ₁₀ , Total	1,300.2
Boiler PM _{2.5} , Total	876.6
Mat. Handling PM	68.1
Mat. Handling PM ₁₀	24.4
Mat. Handling PM _{2.5}	24.4
PM, Total	1,736.1
PM ₁₀ , Total	1,324.6
PM _{2.5} , Total	901.0

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- (b) Table 4 contains the pollutant-specific emission rates from DEK-1, DEK-2, JCW-7 and JCW-8. These emission rates have been used, along with projected heat input rates in the absence of the proposed project, to determine the emission rates that the boilers could have accommodated.

Table 4. Emission Rates with the Existing ESP Control Systems

Pollutant	Karn 1 (lb/MMBtu)	Karn 2 (lb/MMBtu)	Weadock 7 (lb/MMBtu)	Weadock 8 (lb/MMBtu)
CO ¹	0.0276	0.0276	0.0276	0.0276
NO _x ²	0.2480	0.1623	0.3361	0.3160
SO ₂ ²	0.8660	0.8883	0.9339	0.9252
VOC ¹	0.0033	0.0033	0.0033	0.0033
Lead ¹	2.32E-05	2.32E-05	2.32E-05	2.32E-05
PM, Filt ³	0.0183	0.0423	0.0494	0.0447
Sulfur Content ⁴	0.47	0.49	0.50	0.49
PM, Cond ³	0.0169	0.0189	0.0198	0.0188

¹ These emission factors are presented in the AP-42 as lb/ton emission factors. They were converted to units of lb/MMBtu by assuming an as-fired coal heating value of 9,068 Btu/lb. This heating value represents the minimum as-fired coal heating value for DEK Units 1&2 and JCW 7&8 between January of 2003 and December of 2007, and was chosen to provide a conservative lb/MMBtu emission factor.

² These emission rates are based upon the CEMS derived mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

³ These emission rates are based upon the calculated mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

⁴ The approximate coal sulfur content values are presented for informational purposes and represent the calculated sulfur content based upon the PM, condensable emission factor and the CPM-TOT emission factor formula presented in AP-42 Table 1.1-5 for pulverized coal-fired boilers without FGD controls.

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
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- (c) Table 5 contains the projected heat input rates in MMBtu/year for the 5 year period after the new equipment becomes operational, assuming that the new equipment was not installed and that the existing ESP control systems remained in place. The 5 year period was chosen according to R336.2801(II)(i) as the project does not involve increasing the emissions unit's design capacity or its potential to emit of a regulated new source review pollutant. As the project is not expected to be completed until January 1, 2013, the projection period will include the 5-year period from 2013 through 2017.

Table 5. Projected Heat Input Rates with the Existing ESP Control Systems and without ACI/SL.

Unit	Heat Input Rates ¹ (MMBtu/year)				
	2013	2014	2015	2016	2017
KARN 1	20,203,648	15,809,267	19,305,343	18,292,425	18,652,407
KARN 2	20,145,638	19,631,711	18,868,471	19,464,520	16,902,473
WEAD 7	9,782,179	11,010,738	10,665,758	11,067,611	10,694,315
WEAD 8	12,323,033	11,730,814	11,969,740	9,684,324	11,969,402
Totals	62,454,498	58,182,530	60,809,313	58,508,879	58,218,597

¹ The heat input rates were obtained from PROMOD and then adjusted to account for the bias recorded by the CEMS. From 2002-2007, the bias ranged from a low of 3.1% to a high of 14.4%. The calendar year 2006 was chosen as the representative year, with Karn 1 at 8.9%, Karn 2 at 9.5%, Weadock 7 at 7.9%, and Weadock 8 at 12.9%.

Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
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- (d) Table 6 contains the predicted maximum emissions of each criteria pollutant which each existing emission unit "could have accommodated" (i.e., those that are excludable) over the 5 year projection period. As defined in R336.2801(II)(ii)(C), the heat input rates in Table 4 were multiplied by the emission rates in Table 3 to determine the emissions that each unit "could have accommodated" over the 5 year period. The maximum values are presented in bold.

Table 6. Excludable Emissions with the Existing ESP Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
CO	860.9	802.0	838.2	806.5	802.5
NO _x	7,730.6	7,256.9	7,608.3	7,237.5	7,372.6
SO ₂	27,964.3	26,133.0	27,257.2	26,213.8	26,114.5
VOC	103.3	96.2	100.6	96.8	96.3
Lead	0.72	0.67	0.70	0.68	0.67
PM, Total ^{1,2}	1,772.3	1,698.1	1,735.0	1,674.2	1,661.4
PM ₁₀ , Total ^{1,2}	1,349.6	1,290.1	1,320.6	1,274.2	1,264.6
PM _{2.5} , Total ^{1,2}	918.2	871.8	897.4	865.4	859.3

¹ For the boiler particulate matter emissions, the particle size distributions for filterable PM₁₀ and PM_{2.5} (from an ESP controlled unit) were obtained from the AP-42. The fraction of filterable particulate matter that is PM₁₀ is 0.67 and the fraction of filterable particulate matter that is PM_{2.5} is 0.29.

² These particulate matter emission rates include the PM emissions from the boilers (both condensable and filterable) as well as those associated with the coal and ash handling operations. The PM emissions from the coal handling operations are calculated consistent with the historic MAERS submittals, while the PM emissions associated with the ash handling operations are calculated consistent with the support document and related materials for Permit No. 102-06.

The projected particulate matter emission rates that would occur without the installation of FF/ACI/SI controls include the PM emissions from the coal and ash handling operations. The coal handling PM emission rates have been calculated consistent with prior MAERS submittals. However, the historic wet fly ash handling system is being replaced with a dry fly ash handling system addressed in the recently issued Permit to Install (PTI) No. 102-06. Consistent with the supporting material for the permit, along with

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
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the ash throughput of 350,363 tons per year, the following emission factors have been derived from the April 28, 2006 revised Table 3-2:

- PM = 1.31E-01 lb/ton ash (derived from 22.97 tons/year)
- PM₁₀ = 6.90E-02 lb/ton ash (derived from 12.09 tons/year)
- PM_{2.5} = 4.16E-02 lb/ton ash (derived from 7.29 tons/year)

The breakdown between the particulate emissions associated with the boilers and material handling is presented in Table 7.

Table 7. Breakdown of Excludable Particulate Emissions with the Existing ESP Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
Boiler PM, Filt	1,128.0	1,094.0	1,106.7	1,068.9	1,059.8
Boiler PM ₁₀ , Filt	755.7	733.0	741.5	716.1	710.1
Boiler PM _{2.5} , Filt	327.1	317.3	320.9	310.0	307.3
Boiler PM, Cond	573.7	538.3	559.5	539.0	535.7
Boiler PM, Total	1,701.7	1,632.3	1,666.1	1,607.9	1,595.5
Boiler PM ₁₀ , Total	1,329.4	1,271.3	1,300.9	1,255.2	1,245.7
Boiler PM _{2.5} , Total	900.8	855.5	880.4	849.0	843.0
Mat. Handling PM	13.7	13.1	13.3	10.8	13.3
Mat. Handling PM ₁₀	3.9	3.7	3.8	3.1	3.8
Mat. Handling PM _{2.5}	3.4	3.2	3.3	2.7	3.3
PM, Total	1,772.3	1,698.1	1,735.0	1,674.2	1,661.4
PM ₁₀ , Total	1,349.6	1,290.1	1,320.6	1,274.2	1,264.6
PM _{2.5} , Total	918.2	871.8	897.4	865.4	859.3

- (e) Table 8 contains the emission rates of each criteria pollutant from each respective emission unit after each FF/ACI/SI pollution control system is installed.

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The expected vendor guarantee based on initial discussions is 0.015 lb/MMBtu PM, Filt, while the lb/MMBtu baseline rates are 0.0183 for Karn 1, 0.0423 for Karn 2, 0.0494 for Weadock 7, and 0.0447 for Weadock 8. Thus, replacing the ESP control systems with fabric filter control systems will result in lower filterable particulate emission rates. The other criteria pollutant lb/MMBtu emission rates are not expected to increase as a result of this project.

While Consumers Energy is planning to install sorbent injection (SI) systems on all four units for controlling SO₂ emissions, the actual usage of the SI systems will be determined on an as-needed basis due to the economic fluctuations of a cap and trade system (as allowed by the Acid Rain Program and Clean Air Interstate Rule). In general, when the allowance prices are more expensive than operation and maintenance costs associated with the SI systems, Consumers Energy will operate the SI systems. Therefore, the SO₂ emissions have been evaluated on a worst-case basis assuming there are no reductions from using the SI systems. However, the worst-case scenario for particulate emissions is to assume maximum sorbent usage. Thus, the particulate emissions have been evaluated according to their worst-case scenario which is to assume sorbent usage. The projected emission rates, heat inputs, and emissions from the FF/ACI/SI systems are presented in Tables 8, 9 & 10, respectively. The bolded values in Table 10 represent the maximum expected projected actual emissions.

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Table 8. Projected Emission Rates with the New FF/ACI/SI Control Systems

Pollutant	Karn 1 (lb/MMBtu)	Karn 2 (lb/MMBtu)	Weadock 7 (lb/MMBtu)	Weadock 8 (lb/MMBtu)
CO ¹	0.0276	0.0276	0.0276	0.0276
NO _x ²	0.2480	0.1623	0.3361	0.3160
SO ₂ ²	0.8660	0.8883	0.9339	0.9252
VOC ¹	0.0033	0.0033	0.0033	0.0033
Lead ¹	2.32E-05	2.32E-05	2.32E-05	2.32E-05
PM, Filt ³	0.015	0.015	0.015	0.015
Sulfur Content ⁴	0.47	0.49	0.50	0.49
PM, Cond ⁵	0.0169	0.0189	0.0198	0.0188

¹ These emission factors are presented in the AP-42 as lb/ton emission factors. They were converted to units of lb/MMBtu by assuming an as-fired coal heating value of 9,068 Btu/lb. This heating value represents the minimum as-fired coal heating value for DEK Units 1&2 and JCW 7&8 between January of 2003 and December of 2007, and was chosen to provide a conservative lb/MMBtu emission factor.

² These emission rates are based upon the CEMS derived mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

³ These are based on the preliminary vendor guarantee.

⁴ The approximate coal sulfur content values are presented for informational purposes and represent the calculated sulfur content based upon the PM, condensable emission factor and the CPM-TOT emission factor formula presented in AP-42 Table 1.1-5 for pulverized coal-fired boilers without FGD controls.

⁵ These emission rates are based upon the calculated mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

(f) Table 9 contains the projected heat input rates in MMBtu/year for the 5 year projection period after the new equipment becomes operational.

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Table 9. Projected Heat Input Data with the New FF/ACI/SI Control Systems

Unit	Heat Input Rates ¹ (MMBtu/year)				
	2013	2014	2015	2016	2017
KARN 1	19,983,733	15,722,993	19,320,951	18,478,706	18,828,537
KARN 2	20,052,913	19,567,181	18,924,971	19,536,093	16,949,214
WEAD 7	9,926,611	11,133,148	11,112,572	11,464,405	11,038,738
WEAD 8	12,374,781	11,725,125	12,294,823	9,934,826	12,305,761
Totals	62,338,038	58,148,447	61,653,317	59,414,031	59,122,250

¹ The heat input rates were obtained from PROMOD and then adjusted to account for the bias recorded by the CEMS. From 2002-2007, the bias ranged from a low of 3.1% to a high of 14.4%. The calendar year 2006 was chosen as the representative year, with Karn 1 at 8.9%, Karn 2 at 9.5%, Weadock 7 at 7.9%, and Weadock 8 at 12.9%.

- (g) Table 10 contains the predicted maximum combined emissions of each criteria pollutant from the existing emission units (i.e. DEK 1&2 and JCW 7&8) after the new equipment is installed, including the PM emissions associated with the ACI and SI storage silos. [Note: Derivation of the PM emission rates from the storage silos is presented in Section C.a.(2), page 17.] The projected heat input rates in Table 9 were multiplied by the emission rates in Table 8 to determine these projected emissions over the 5 year projection period. The maximum values are presented in bold.

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Table 10. Projected Actual Annual Emissions with the New FF/ACI/SI Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
CO	859.3	801.6	849.9	819.0	815.0
NO _x	7,728.3	7,260.7	7,741.3	7,372.7	7,509.2
SO ₂	27,919.3	26,121.5	27,648.1	26,627.4	26,527.9
VOCs	103.1	96.2	102.0	98.3	97.8
Lead	0.72	0.67	0.71	0.69	0.68
PM, Total ^{1,2}	1,115.5	1,044.7	1,104.4	1,065.1	1,059.2
PM ₁₀ , Total ^{1,2}	1,027.8	962.7	1,017.6	981.4	975.9
PM _{2.5} , Total ^{1,2}	842.6	790.0	834.4	804.9	800.2

¹ For the boiler particulate matter emissions, the particle size distributions for filterable PM₁₀ and PM_{2.5} from a fabric filter controlled unit were obtained from the AP-42. The fraction of filterable particulate matter that is PM₁₀ is 0.92 and the fraction of filterable particulate matter that is PM_{2.5} is 0.53.

² These particulate matter emission rates also include the PM emissions associated with boilers (both filterable and condensable) as well as the coal and ash handling operations.

The PM emissions from the coal handling operations are calculated consistent with the historic MAERS submittals, while the PM emissions associated with the ash handling operations are calculated consistent with the support document and related materials for Permit No. 102-06. All solid wastes associated with SI are assumed to be collected with the fly ash. The breakdown of particulate emissions between the boilers and material handling operations is displayed in Table 11.

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Table 11. Breakdown of Projected Actual Annual Particulate Emissions with the New FF/ACI/SI Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
Boiler PM, Filt	467.5	436.1	462.4	445.6	443.4
Boiler PM ₁₀ , Filt	430.1	401.2	425.4	410.0	407.9
Boiler PM _{2.5} , Filt	247.8	231.1	245.1	236.2	235.0
Boiler PM, Cond	572.9	538.1	567.6	547.6	544.2
Boiler PM, Total	1,040.4	974.2	1,030.0	993.2	987.6
Boiler PM ₁₀ , Total	1,003.0	939.3	993.0	957.5	952.1
Boiler PM _{2.5} , Total	820.6	769.2	812.7	783.7	779.2
Mat. Handling PM	75.2	70.4	74.4	71.9	71.6
Mat. Handling PM ₁₀	24.8	23.4	24.6	23.8	23.7
Mat. Handling PM _{2.5}	21.9	20.8	21.8	21.1	21.1
PM, Total	1,115.5	1,044.7	1,104.4	1,065.1	1,059.2
PM ₁₀ , Total	1,027.8	962.7	1,017.6	981.4	975.9
PM _{2.5} , Total	842.6	790.0	834.4	804.9	800.2

As discussed for Table 11, the ash handling emissions also include the additional wastes associated with SI for SO₂ control (assumed to be collected with the fly ash). This is the worst case scenario for particulate emissions. In order to target up to a 70% removal in SO₂, it is anticipated that about 3.53 pounds of sorbent will have to be injected for every pound of available SO₂. This sorbent injection rate would result in a solids by-product waste generation rate of 2.72 pounds per pound of available SO₂. Thus, the additional solid waste generation rate has been determined by multiplying the projected SO₂ emission rates in Table 8 by a ratio of 2.72. However, when evaluating the worst case scenario for SO₂ emissions, it was assumed that there is no sorbent injection (i.e., no SO₂ control through the usage of sorbent injection). Aside from the additional wastes being going to the ash handling system, the methods of calculating the PM emissions from

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the coal and ash handling operations remain the same as those discussed in relation to Table 6.

- (h) Table 12 contains the predicted maximum change in aggregate emissions of each criteria pollutant associated with the FF/ACI/SI pollution control project and illustrates that the aggregate emission change for each criteria pollutant is well below the respective significance level.

Table 12. Summary of Baseline Actual Emissions, Excludable Emissions, Projected Actual Emissions and Emission Increases (tpy)

NSR Pollutant	(A) Baseline Actual Emissions	(B) Excludable Emissions	(C) Projected Actual Emissions	(F) Emissions Change, (C - the larger of A or B)	PSD Significant Emission Levels
CO	733.8	860.9	859.3	-1.6	100
NO _x	8,527.4	7,730.6	7,728.3	-799.1	40
SO ₂	27,520.0	27,964.3	27,919.3	-45	40
VOCs	88.1	103.3	103.1	-0.2	40
Lead	0.61	0.72	0.72	0	0.6
PM, Total	1,736.1	1,772.3	1,115.5	-656.8	25
PM ₁₀ , Total	1,324.6	1,349.6	1,027.8	-321.9	15
PM _{2.5} , Total	901.0	918.2	842.6	-75.6	NA

- (2) The installation of the storage silos for the activated carbon and sodium bicarbonate or equivalent sorbent will not be subject to PSD nor result in an increase in the actual emissions of any criteria pollutant that is greater than the respective significance level.

Silo emission rates include filterable PM only (all PM is conservatively assumed to be less than 2.5 microns in mean diameter). The ACI will be received by truck and offloaded pneumatically to one of four (4) fabric filter control silos. The sorbent will be train delivered and offloaded to one of four (4) fabric filter control silos. While offloading operations are projected to occur 8 hours per day, and the fabric filter will only be in service when material is being transferred to the silo it is serving, the

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projected actual emissions have been calculated based upon the potential to emit (i.e., operating 24 hours per day) from each silo as follows:

$$\frac{1500 \text{ ft}^3}{\text{Min}} \times \frac{0.01 \text{ gr}}{\text{ft}^3} \times \frac{\text{lb}}{7000 \text{ gr}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{24 \text{ hr}}{\text{day}} \times \frac{365 \text{ day}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{0.56 \text{ ton}}{\text{year}}$$

The maximum for 8 silos is therefore 4.5 tons per year.

$$\frac{0.56 \text{ ton}}{\text{year}} \times 8 \text{ silos} = \frac{4.5 \text{ tons}}{\text{year}}$$

- (3) The combined particulate emissions attributable to both the injection of activated carbon and sodium bicarbonate or equivalent sorbent and the 8 storage silos will not result in emission rates that will make the installation subject to PSD or represent an increase in actual emissions of particulate that is greater than the significance levels.

As shown in Table 12, the installation of FF/ACI/SI controls will not result in an emissions increase for any criteria pollutant. Rather, the installation of the FF/ACI/SI results in future projected actual emission rates that are lower than the emission rates that the units could have accommodated during the 5-year projection period in the absence of the project.

- b. *Rule 278(2)-(3) – The proposed project will not be subject to the federal standards contained 40 CFR Part 61 and 40 CFR Part 63.*

The installation of the FF/ACI/SI control systems will not construct or reconstruct a major source of hazardous air pollutants pursuant to 40 CFR Part 63. The total fixed capital cost of the control systems is \$260 million which is less than 50 percent of the fixed capital cost that would be required to construct a comparable new source. The generating capacity of Weadock 7&8 and Karn 1&2 is 821 MW and the cost for a new 800 MW coal fired electrical generating unit is in excess of \$2 billion. Furthermore, the installation does not meet the requirements for “construction” or “modification” as defined in 40 CFR Part 61.

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IV. CONCLUSION

In summary, the proposed air pollution control system project is eligible for exemption from air permitting. The material storage silos are eligible for exemption under Rule 284(k). The injection of activated carbon and sodium bicarbonate or equivalent sorbent, respectively for mercury and SO₂ control, is eligible for exemption under Rule 285(f). The fabric filters with new ID fans are exempt under Rule 285(d). The combined emission changes associated with this project do not result in the project being subject to PSD or otherwise being excluded from exemption by Rule 278.

It should also be noted that on December 21, 2007 the US Environmental Protection Agency published in the Federal Register a final rule regarding the standard for recordkeeping, monitoring, and reporting related to evaluating whether projects at existing sources result in a significant emissions increase under the "actual-to-projected-actual" test. Under the Final Rule, an Electric Generating Unit (EGU) that uses the "actual-to-projected-actual" test to evaluate potential NSR applicability for a project must submit its evaluation to the permitting authority prior to the commencement of construction of the project, and must submit annual emissions reports for 5 or 10 years (depending on the type of project), if the EGU's pre-project analysis shows that the project would result in an emissions increase of more than 50% of the NSR threshold (for the pollutant at issue). If the project is not projected to result in such an emissions increase, the EGU must nonetheless keep records of its emissions increase analysis only if the projected post-project emissions -- without accounting for emission increases that are not caused by the project -- exceed baseline emissions by more than 50% of the NSR threshold (for the pollutant at issue). This R336.278a demonstration is consistent with these new requirements. Since the projected post-project emissions do not exceed the baseline emissions by more than 50% of the NSR thresholds, records and recordkeeping is not required under the new federal rules. Annual actual emission reports will still be required to be submitted to the MDEQ through the MAERS reports.

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ATTACHMENT 1

Two AQCS projects are proposed for the Karn 1&2 and Weadock 7&8 units. One project consists of installing equipment for mercury and SO₂ reduction on all four units, while the other project consists of installing low NO_x burners on Weadock 7&8. This attachment documents why the two AQCS projects at the Karn 1&2 Units and Weadock 7&8 Units are independent of the ASCPC project and of each other for purposes of determining New Source Review (NSR) applicability.

The Projects

The following activities are being proposed:

1. Installation of fabric filters (FF) on all four units.
2. Installation of 4 silos for the storage of powdered activated carbon (PAC). The PAC is to be injected into the exhaust gases prior to the new FF to provide for the reduction of mercury (Hg) emissions.
3. Installation of 4 silos for the storage of a sorbent such as sodium bicarbonate. The sorbent is to be injected into the exhaust gases prior to the new FF to provide for the reduction of sulfur dioxide (SO₂) emissions.
4. The installation of the FFs will require new ID fans on all 4 units because of the increased pressure drop across the AQCS.
5. Installation of low NO_x burners on two units - Weadock 7&8.

Permitting Guidance and Requirements

The air permitting requirements are significantly impacted by whether or not the proposed two K/W AQCS projects need to be "aggregated" with the ASCPC permit application. Aggregation of projects is the subject of USEPA guidance.

On September 14, 2007 USEPA [Federal Register: Volume 71, Number 178] proposed "to add our aggregation policy to our NSR regulations to achieve greater national consistency and provide further clarity in aggregation determinations. This proposal clarifies our existing policy and provides specific circumstances where emissions should be aggregated for purposes of NSR applicability.

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EPA proposes to revise the regulations to state that a source must aggregate emissions from projects that are technically or economically dependent. This same policy would be used in EPA's case-by-case after-the-fact inquiry of whether a source has circumvented NSR through a failure to aggregate dependent projects." (emphasis added)

Technical Dependence

USEPA states:

"The terms "technically dependent" and "technical dependence" describe the interrelationship between projects such that one project is incapable of performing as planned in the absence of the other project. This means that, absent another project, the process change cannot operate without significant impairment, or for the planned amount of hours, or at the planned rating or production level, or that it operates in a manner that results in a product of inferior quality. This assessment examines, and applies reasonable engineering assumptions to, the planned operational levels and/or specifications that are relied upon in the company's own descriptions of and/or justifications for the project. Thus, the technical viability of one project is ultimately contingent on another project being completed (i.e., it is technically dependent)."

USEPA goes on to provide 3 indications of technical dependence.

- A project cannot operate within its maximum design parameters for an extended period of time without the other project(s).
- A source cannot achieve its maximum production without the implementation of both projects.
- If the intention for a project is to make a new product, and absence of another project would not allow for full production of the new product, then the projects are technically dependent. In this case, one project must be done by virtue of another project, or the overall project would fail to operate.

Based on these criteria and the examples given by USEPA, the ASCPC and the AQCS projects are undeniably technically independent. The FF, PAC Injection, Trona Injection, ID fan installation and LNB addition will operate independently from the ASCPC project: 1) they can operate within their maximum design parameters for an extended period of time without the ASCPC project; 2) they can achieve maximum production without the implementation of the ASCPC project; and 3) the intention of the two AQCS projects is not to make a new product

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and the absence of the ASCPC project has no effect on the AQCS projects. The addition of controls for the existing units would result in a net air quality benefit, and is solely for compliance with the state and federal NO_x, SO₂, and Hg regulations as currently prescribed and or anticipated.

Economic Dependence

With respect to economic dependency, USEPA states:

"Activities are dependent on each other for their economic viability if the economic revenues or 'Return on Investment' (ROI) associated with the project could not be realized without the completion of the other project. ROI is a measure of the worth in investing and is sometimes informally referred to as "payback," which is an equivalent concept but is a more simplistic determination of the time it takes for savings or revenues generated from a project to equal the cost of the project. ROI is generally expressed as a percentage linked to a time frame (e.g., 15 percent over 3 years). In contrast to payback, ROI takes into account the value of money over time. Economic dependence is generally evidenced when a particular project that may indeed be capable of operating technically independent from other planned projects is nevertheless planned or integrated as part of a larger project goal and is interrelated to such an extent that it is not economically viable as a stand alone project because both (or all) the projects are necessary for the larger project to achieve the operational level that justifies the investment of the planned project. While an argument can be made that all projects and activities at a source are economically linked, since they all contribute to the company's 'bottom line,' we are clearly not proposing such an approach. Our approach would require that a source treat one project as economically dependent on another if it is no longer economically viable without the completion of the other project(s). Economic viability is measured by assessing the ROI or payback of a project, such that a project is not economically viable if it does not pay for itself (e.g., yield a positive expected rate of return) in the absence of another related project." (Emphasis added).

Consumers Energy Company has announced its intention to finance and utilize only 500MWs of the 800MW ASCPC output, seeking municipal partners for the financing and offtake of the remaining 300MWs. The two AQCS projects and the ASCPC project stand on their own, and are not economically dependent on each other as evidenced by the financing and ownership structures.

Timing

USEPA also address the timing factor in making aggregation determinations. They stated:

"Under our current aggregation policy, there is no presumption that projects automatically are or are not aggregated as a result of their proximity in time. We believe that projects that happen to occur simultaneously at a source do not necessarily have any inherent relationship. Certainly, if concurrent projects occur at the same emissions unit, then there may be a greater sense of interrelationship, but it still does not provide conclusive evidence that they are

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dependent on each other. As previously stated, the technical and economic viability of a project are the sole objective criteria that a source and reviewing authority must consider when making an aggregation determination. Timing of construction scheduling, or time horizons for economic planning, may weigh into a determination of economic or technical dependence, but timing, in and of itself, is not determinative in deciding whether to aggregate projects. The reviewing authority could, for example, review the technical and economic relation to other projects occurring within a short period of time (e.g., within 18 months) as they review activity at regulated sources but would need to determine the technical and/or economic relationship of these projects – not simply their proximity in time – to make a determination about aggregation." (Emphasis added).

Consumers Energy is cognizant of the fact that the ASCPC permitting project may exceed the standard permitting timeline and milestones for a major air permit and may in fact intersect with the AQCS projects. Nonetheless, the ASCPC and AQCS projects are technically and economically independent and the timing of one should not impact or delay the timing of the others.

Because the ASCPC project and the two AQCS projects are independent both technically and economically as set forth above, in spite of their proximity in time, they can be permitted separately.



Linda M
Hilbert/Pr/Consumers/CMS
02/21/2008 03:47 PM

To harec@michigan.gov
cc drector@nthconsultants.com, Scott J
Sinkwitts/Mc/Consumers/CMS@CMS
bcc Linda M Hilbert/Pr/Consumers/CMS
Subject Revised Rule 278a Exemption Demonstration

Hi Chris-

Per our phone conversation, attached is the revised Rule 278a Exemption Demonstration for the pollution control projects we are looking to install at the Karn/Weadock site.

The main change in this document is in reference to the sorbent injection project being installed under R336.1283(1)(a)(v) as a pilot project in order to help develop equipment design and operating parameters for appropriate use in the future.

Recent updates from engineering also show an additional bulk storage silo for the site accompanied by a reduction in the design flow rates. This change is reflected in some of the numbers starting with material handling particulate matter in Table 11. These modifications do not change the conclusion of the calculations which shows that the project does not result in an emission increase for any criteria pollutant.

If you have any questions, please let me know.



Rule 278a Exemption Demo Revised Ver 2.doc

Linda M. Hilbert, P.E.
Consumers Energy
Environmental Director, New Generation
(517)788-0044 (phone)
(517)745-3137 (cell)
(517)788-2329 (fax)

**Michigan Rule 278a Exemption Demonstration
Installation of Air Pollution Control Equipment at the Karn/Weadock Complex
Revised February 21, 2008**

I. INTRODUCTION

Any facility that operates a source of air pollution that is exempt under the provisions of Rules 280 through 290 is required to demonstrate the applicability of the exemption upon request of the MDEQ per R336.1278a.

This demonstration shows that, pursuant to R336.1285(d)&(f), R336.1284(k) and R336.1283(1)(a)(v), the installation of air pollution control equipment on four (4) units at the Karn/Weadock Complex is eligible for exemption from the requirement of R336.1201 for a permit to install.

II. SITE DESCRIPTION

The Karn/Weadock Complex (SRN B2840) is located at 2742 North Weadock Highway in Hampton Township, Michigan in northern Bay County. The facility sits at the mouth of the Saginaw River along the shores of Saginaw Bay and encompasses approximately 2400 total acres. The Karn/Weadock Complex is one contiguous site consisting of three (3) distinct power plants: the 310 MW Weadock 7 and 8 plant; the 511 MW Karn 1 and 2 plant; and the 1,276 MW Karn 3 and 4 plant. Both the Weadock 7 and 8 plant and Karn 1 and 2 plant consist of coal-fired boilers while the Karn 3 and 4 plant consist of natural gas and oil co-fired boilers. Together, the six units at the Karn/Weadock Complex have the capacity to generate up to 2,097 MW.

III. RULE 278a DEMONSTRATION

The following demonstrates pursuant to R336.1278a that the project consisting of the four (4) air quality control systems (AQCS) which include fabric filter, activated carbon injection, and sorbent injection (FF/ACI/SI) systems are eligible for exemption from the air use-permitting requirement in R336.1201. The demonstration is organized consistent with R336.1278a(1)(a), (b), and (c) and includes the following information:

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A. "A description of the exempt process or process equipment, including the date of installation." - Rule 278a(1)(a)

Each AQCS will provide additional control for existing emissions by injecting sorbents (including activated carbon) into each respective exhaust stream, so that the sorbents may adhere to or react with various gaseous pollutants, like mercury and/or SO₂, and then filtering out the sorbent/pollutant material through the use of fabric filters.

Each AQCS will consist of a fabric filter, activated carbon storage and injection (ACI), and sodium bicarbonate (or an equivalent sorbent) storage and injection (SI) on each of the following units: D. E. Karn 1 and 2 (DEK-1 and DEK-2, or DEK 1&2), J. C. Weadock 7 and 8 (JCW-7 and JCW-8, or JCW 7&8). This includes new induced draft (I.D.) fans for each unit to overcome the increased pressure drop from the fabric filters, and four (4) ACI storage silos and four (4) SI day storage silos and one (1) SI bulk storage silo. The fans will be sized to deliver the same air flow as required by the current heat input limits, which is consistent with measured air flow from recent stack tests. The new material storage silos will have fan assisted bin vent filters with design flow rates of 600 ACFM each, except for the SI bulk storage silo that will be 1000 ACFM.

Consumers Energy plans to begin construction on the FF/ACI/SI systems in spring 2008. The expected dates when the systems will be operating are presented in Table 1.

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Table 1. Expected Dates of Operation

UNIT	TECHNOLOGY	OPERATION DATE
DEK-1	Fabric Filter	1/1/2010
	Activated Carbon	1/1/2010
	Sorbent	7/1/2012
DEK-2	Fabric Filter	4/1/2010
	Activated Carbon	4/1/2010
	Sorbent	1/1/2013
JCW-7	Fabric Filter	1/1/2010
	Activated Carbon	1/1/2010
	Sorbent	1/1/2010
JCW-8	Fabric Filter	1/1/2010
	Activated Carbon	1/1/2010
	Sorbent	1/1/2010

**B. "The specific exemption being used by the process or process equipment." -
Rule 278a(1)(b)**

To accomplish the goal of controlling existing pollutants in each exhaust gas stream from each EGU, three types of physical process changes are necessary for each respective EGU:

1. Installation of activated carbon and other sorbent storage silos (i.e. storage silos for the ACI and SI). Eligible for exemption under R336.1284(k).
2. Installing equipment that will inject activated carbon and other sorbents into each exhaust stream for the purpose of controlling existing mercury and SO₂ emissions. Eligible for exemption under R336.1285(f).
3. Replacing the existing electrostatic precipitators with fabric filter baghouses to increase the existing particulate matter removal capacity to accommodate the removal of the

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sorbent and pollutants from the exhaust stream. Eligible for exemption under R336.1285(d).

a. *Storage silos / Rule 284(k)*

The installation of the new activated carbon and sodium bicarbonate or equivalent sorbent storage silos is eligible for exemption under Rule 284(k) which states:

Except as specified in R 336.1278, the requirement of R 336.1201(1) to obtain a permit to install does not apply to containers, reservoirs, or tanks used exclusively for any of the following:

* * *

(k) Storage containers of noncarcinogenic solid material, including silos, which only emit particulate matter and which are controlled with an appropriately designed and operated fabric filter collector system or an equivalent control system.

Activated carbon, sodium bicarbonate and related sorbents are noncarcinogenic solid materials and the silos will be equipped with fabric filters. The only emissions expected from each silo will be particulate emissions associated with loading or emptying, and these emissions will be controlled by an appropriately designed bin vent fabric filter. The size, designed emission rate and expected emissions for each bin vent fabric filter are listed in Subsection C.a(2) below.

b. *Activated Carbon Injection and Sorbent Injection / Rule 285(f)*

The installation of equipment that will inject activated carbon and sodium bicarbonate or equivalent sorbent into each exhaust stream is eligible for exemption under Rule 285(f) which states:

The requirement of R 336.1201(1) to obtain a permit to install does not apply to any of the following:

* * *

Installation or construction of air pollution control equipment for an existing process or process equipment if the control equipment itself does not actually generate a significant amount of criteria air

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contaminants as defined in R 336.1119(e) or a meaningful quantity
of toxic air contaminants.

Each EGU for which a FF/ACI/SI pollution control system is proposed (i.e. DEK-1, DEK-2, JCW-7, and JCW-8) is an existing emission unit. The injection equipment itself will not generate significant emissions of criteria air contaminants or a meaningful quantity of toxic air contaminants. Indeed, due to the installation of fabric filters on the existing boilers, there will likely be no measurable emissions from the injection equipment.

- c. *Replacement of existing electrostatic precipitators with new fabric filters /
Rule 285(d)*

The installation of each new fabric filter and associated ID fan system is eligible for exemption under R336.1285(d) which states:

The requirement of R 336.1201(1) to obtain a permit to install does
not apply to any of the following:

* * *

- (d) Reconstruction or replacement of air pollution control
equipment with equivalent or more efficient equipment.

Each new fabric filter and associated ID fan system will replace the existing electrostatic precipitators (ESP) for its respective EGU. After the new fabric filters are installed and operational, the existing ESPs will be removed from service. Replacing the current ESP with fabric filter control systems will result in lower filterable particulate emission rates. The expected vendor guarantee based on initial discussions is 0.015 lb/MMBtu PM₁₀, Filt, which is less than the baseline emission rates from each ESP as shown in Table 3.

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C. "An analysis demonstrating that R 336.1278 does not apply to the process or process equipment." - Rule 278a(1)(c)

The following analysis demonstrates that R336.1278 does not exclude the process or process equipment from otherwise being eligible for exemption. The analysis is organized according to the individual subparts of Rule 278.

- a. *Rule 336.1278(1)(a) and (b) – Demonstration that the proposed project(s) are not subject to PSD and will not result in an increase in actual emissions of a criteria pollutant that is greater than the respective significance level.*

As shown below, the installation of the four FF/ACI/SI control systems will not be subject to the PSD regulations nor result in an increase in actual emissions greater than the R336.1119 significance levels. The analysis that follows is based on considering this project independent of both the Advanced Supercritical Pulverized Coal-fired (ASCPC) boiler project and the low NOx burner project for JCW 7&8. The technical and economic independence of this project is discussed in Attachment 1.

- (1) The combined emissions change of each criteria pollutant from DEK 1&2 and JCW 7&8 that will occur as a result of the installation of the FF/ACI/SI pollution control system for each emission unit will be less than the respective significant level for each criteria pollutant.

To determine if the proposed project would be considered a major modification as defined in the PSD regulations, an "Actual-to-projected-actual applicability test" was performed in accordance with R336.12802(4)(c). The Baseline Actual Emissions (BAE) were first determined as the average rates the four boilers (and appropriate ancillary operations) actually emitted, in tons per year, calculated over a consecutive 24-month period. The projection period for the project was determined as 5 years from the date that the project resumes regular operation, as the project will not increase the design capacity or potential to emit of any of the associated emission units.

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Over the projection period, both Projected Actual Emissions (PAE) and Excludable Emissions (EE) were then calculated based upon forecasted utilization with and without the project. The Emissions Change due to the project was then calculated as the difference between the PAE and the higher of the BAE or EE.

As shown in Table 12, the Emissions Change for each pollutant resulting from this project is less than the respective PSD significance level. Thus, the project is not a major modification under the PSD rules. Since the R336.1119 significant levels are identical to the PSD levels, the project also meets the requirements of R336.1278(1)(b).

The following tables contain the raw data and the results of the calculations performed to determine the aggregate change in emissions of each criteria pollutant associated with the injection of activated carbon and sodium bicarbonate or equivalent sorbent into the exhaust streams from DEK 1&2 and JCW 7&8:

- (a) Table 2 presents a summary of the combined baseline emissions from DEK 1&2 and JCW 7&8. The particulate matter baseline emission rates include those associated with coal and ash handling, calculated consistent with historic Michigan Air Emissions Reporting System (MAERS) submittals.

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Table 2. Baseline Pollutant Emissions

NSR Pollutants	Emissions (tons)	Period	Heat Input (MMBtu)
CO	733.8	Aug-04 to Jul -06	62,710,937
NO _x	8,527.4	Jun-03 to May-05	60,327,046
SO ₂	27,520.0	Feb-05 to Jan-07	61,451,047
VOC	88.1	Aug-04 to Jul -06	62,710,937
Lead	0.61	Aug-04 to Jul -06	62,710,937
PM, Total	1,736.1	May-05 to Apr-07	61,576,447
PM ₁₀ , Total	1,324.6	May-05 to Apr-07	61,576,447
PM _{2.5} , Total	901.0	May-05 to Apr-07	61,576,447

The total particulate emissions is a summation of the particulate emissions from the boilers (both filterable and condensable) as well as those associated with coal and ash handling, calculated consistent with prior MAERS submittals. The individual breakdown of the particulate emissions is shown in the following table.

Table 3. Breakdown of Baseline Particulate Emission Rates

Particulate Source	Emission Rate (tons per year)
Boiler PM, Filt	1,114.6
Boiler PM ₁₀ , Filt	746.8
Boiler PM _{2.5} , Filt	323.2
Boiler PM, Cond	553.4
Boiler PM, Total	1,668.0
Boiler PM ₁₀ , Total	1,300.2
Boiler PM _{2.5} , Total	876.6
Mat. Handling PM	68.1
Mat. Handling PM ₁₀	24.4
Mat. Handling PM _{2.5}	24.4
PM, Total	1,736.1
PM ₁₀ , Total	1,324.6
PM _{2.5} , Total	901.0

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- (b) Table 4 contains the pollutant-specific emission rates from DEK-1, DEK-2, JCW-7 and JCW-8. These emission rates have been used, along with projected heat input rates in the absence of the proposed project, to determine the emission rates that the boilers could have accommodated.

Table 4. Emission Rates with the Existing ESP Control Systems

Pollutant	Karn 1 (lb/MMBtu)	Karn 2 (lb/MMBtu)	Weadock 7 (lb/MMBtu)	Weadock 8 (lb/MMBtu)
CO ¹	0.0276	0.0276	0.0276	0.0276
NO _x ²	0.2480	0.1623	0.3361	0.3160
SO ₂ ²	0.8660	0.8883	0.9339	0.9252
VOC ¹	0.0033	0.0033	0.0033	0.0033
Lead ¹	2.32E-05	2.32E-05	2.32E-05	2.32E-05
PM, Filt ³	0.0183	0.0423	0.0494	0.0447
Sulfur Content ⁴	0.47	0.49	0.50	0.49
PM, Cond ³	0.0169	0.0189	0.0198	0.0188

¹ These emission factors are presented in the AP-42 as lb/ton emission factors. They were converted to units of lb/MMBtu by assuming an as-fired coal heating value of 9,068 Btu/lb. This heating value represents the minimum as-fired coal heating value for DEK Units 1&2 and JCW 7&8 between January of 2003 and December of 2007, and was chosen to provide a conservative lb/MMBtu emission factor.

² These emission rates are based upon the CEMS derived mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

³ These emission rates are based upon the calculated mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

⁴ The approximate coal sulfur content values are presented for informational purposes and represent the calculated sulfur content based upon the PM, condensable emission factor and the CPM-TOT emission factor formula presented in AP-42 Table 1.1-5 for pulverized coal-fired boilers without FGD controls.

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- (c) Table 5 contains the projected heat input rates in MMBtu/year for the 5 year period after the new equipment becomes operational, assuming that the new equipment was not installed and that the existing ESP control systems remained in place. The 5 year period was chosen according to R336.2801(II)(i) as the project does not involve increasing the emissions unit's design capacity or its potential to emit of a regulated new source review pollutant. As the project is not expected to be completed until January 1, 2013, the projection period will include the 5-year period from 2013 through 2017.

Table 5. Projected Heat Input Rates with the Existing ESP Control Systems and without ACI/SL.

Unit	Heat Input Rates ¹ (MMBtu/year)				
	2013	2014	2015	2016	2017
KARN 1	20,203,648	15,809,267	19,305,343	18,292,425	18,652,407
KARN 2	20,145,638	19,631,711	18,868,471	19,464,520	16,902,473
WEAD 7	9,782,179	11,010,738	10,665,758	11,067,611	10,694,315
WEAD 8	12,323,033	11,730,814	11,969,740	9,684,324	11,969,402
Totals	62,454,498	58,182,530	60,809,313	58,508,879	58,218,597

¹ The heat input rates were obtained from PROMOD and then adjusted to account for the bias recorded by the CEMS. From 2002-2007, the bias ranged from a low of 3.1% to a high of 14.4%. The calendar year 2006 was chosen as the representative year, with Karn 1 at 8.9%, Karn 2 at 9.5%, Weadock 7 at 7.9%, and Weadock 8 at 12.9%.

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- (d) Table 6 contains the predicted maximum emissions of each criteria pollutant which each existing emission unit "could have accommodated" (i.e., those that are excludable) over the 5 year projection period. As defined in R336.2801(II)(ii)(C), the heat input rates in Table 4 were multiplied by the emission rates in Table 3 to determine the emissions that each unit "could have accommodated" over the 5 year period. The maximum values are presented in bold.

Table 6. Excludable Emissions with the Existing ESP Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
CO	860.9	802.0	838.2	806.5	802.5
NO _x	7,730.6	7,256.9	7,608.3	7,237.5	7,372.6
SO ₂	27,964.3	26,133.0	27,257.2	26,213.8	26,114.5
VOC	103.3	96.2	100.6	96.8	96.3
Lead	0.72	0.67	0.70	0.68	0.67
PM, Total	1,772.3	1,698.1	1,735.0	1,674.2	1,661.4
PM ₁₀ , Total	1,349.6	1,290.1	1,320.6	1,274.2	1,264.6
PM _{2.5} , Total	918.2	871.8	897.4	865.4	859.3

¹ For the boiler particulate matter emissions, the particle size distributions for filterable PM₁₀ and PM_{2.5} (from an ESP controlled unit) were obtained from the AP-42. The fraction of filterable particulate matter that is PM₁₀ is 0.67 and the fraction of filterable particulate matter that is PM_{2.5} is 0.29.

² These particulate matter emission rates include the PM emissions from the boilers (both condensable and filterable) as well as those associated with the coal and ash handling operations. The PM emissions from the coal handling operations are calculated consistent with the historic MAERS submittals, while the PM emissions associated with the ash handling operations are calculated consistent with the support document and related materials for Permit No. 102-06.

The projected particulate matter emission rates that would occur without the installation of FF/ACI/SI controls include the PM emissions from the coal and ash handling operations. The coal handling PM emission rates have been calculated consistent with prior MAERS submittals. However, the historic wet fly ash handling system is being replaced with a dry fly ash handling system addressed in the recently issued Permit to Install (PTI) No. 102-06. Consistent with the supporting material for the permit, along with

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the ash throughput of 350,363 tons per year, the following emission factors have been derived from the April 28, 2006 revised Table 3-2:

- PM = 1.31E-01 lb/ton ash (derived from 22.97 tons/year)
- PM₁₀ = 6.90E-02 lb/ton ash (derived from 12.09 tons/year)
- PM_{2.5} = 4.16E-02 lb/ton ash (derived from 7.29 tons/year)

The breakdown between the particulate emissions associated with the boilers and material handling is presented in Table 7.

Table 7. Breakdown of Excludable Particulate Emissions with the Existing ESP Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
Boiler PM, Filt	1,128.0	1,094.0	1,106.7	1,068.9	1,059.8
Boiler PM ₁₀ , Filt	755.7	733.0	741.5	716.1	710.1
Boiler PM _{2.5} , Filt	327.1	317.3	320.9	310.0	307.3
Boiler PM, Cond	573.7	538.3	559.5	539.0	535.7
Boiler PM, Total	1,701.7	1,632.3	1,666.1	1,607.9	1,595.5
Boiler PM ₁₀ , Total	1,329.4	1,271.3	1,300.9	1,255.2	1,245.7
Boiler PM _{2.5} , Total	900.8	855.5	880.4	849.0	843.0
Mat. Handling PM	13.7	13.1	13.3	10.8	13.3
Mat. Handling PM ₁₀	3.9	3.7	3.8	3.1	3.8
Mat. Handling PM _{2.5}	3.4	3.2	3.3	2.7	3.3
PM, Total	1,772.3	1,698.1	1,735.0	1,674.2	1,661.4
PM ₁₀ , Total	1,349.6	1,290.1	1,320.6	1,274.2	1,264.6
PM _{2.5} , Total	918.2	871.8	897.4	865.4	859.3

- (e) Table 8 contains the emission rates of each criteria pollutant from each respective emission unit after each FF/ACI/SI pollution control system is installed.

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The expected vendor guarantee based on initial discussions is 0.015 lb/MMBtu PM, Filt, while the lb/MMBtu baseline rates are 0.0183 for Karn 1, 0.0423 for Karn 2, 0.0494 for Weadock 7, and 0.0447 for Weadock 8. Thus, replacing the ESP control systems with fabric filter control systems will result in lower filterable particulate emission rates. The other criteria pollutant lb/MMBtu emission rates are not expected to increase as a result of this project.

Consumers Energy is planning to install sorbent injection (SI) systems on all four units for controlling SO₂ emissions as a full scale pilot processes designed to help develop equipment design and operating parameters and as such, this installation is exempt under Rule 336.1283(1)(a)(v) as well as other eligible exemptions listed earlier in this document. Once the feasibility and effectiveness of this technology is demonstrated and the operating parameters are determined, Consumers Energy will be able to identify any appropriate future use of the systems for regulatory purposes, and incorporate them into the ROP if necessary. For PSD applicability determination purposes, the SO₂ emissions have been evaluated on a worst-case basis assuming there are no reductions from using the SI systems. However, the worst-case scenario for particulate emissions is to assume maximum sorbent usage. Thus, the particulate emissions have been evaluated according to their worst-case scenario which is to assume sorbent usage. The projected emission rates, heat inputs, and emissions from the FF/ACI/SI systems are presented in Tables 8, 9 & 10, respectively. The bolded values in Table 10 represent the maximum expected projected actual emissions.

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Table 8. Projected Emission Rates with the New FF/ACI/SI Control Systems

Pollutant	Karn 1 (lb/MMBtu)	Karn 2 (lb/MMBtu)	Weadock 7 (lb/MMBtu)	Weadock 8 (lb/MMBtu)
CO ¹	0.0276	0.0276	0.0276	0.0276
NO _x ²	0.2480	0.1623	0.3361	0.3160
SO ₂ ²	0.8660	0.8883	0.9339	0.9252
VOC ¹	0.0033	0.0033	0.0033	0.0033
Lead ¹	2.32E-05	2.32E-05	2.32E-05	2.32E-05
PM, Filt ³	0.015	0.015	0.015	0.015
Sulfur Content ⁴	0.47	0.49	0.50	0.49
PM, Cond ⁵	0.0169	0.0189	0.0198	0.0188

¹ These emission factors are presented in the AP-42 as lb/ton emission factors. They were converted to units of lb/MMBtu by assuming an as-fired coal heating value of 9,068 Btu/lb. This heating value represents the minimum as-fired coal heating value for DEK Units 1&2 and JCW 7&8 between January of 2003 and December of 2007, and was chosen to provide a conservative lb/MMBtu emission factor.

² These emission rates are based upon the CEMS derived mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

³ These are based on the preliminary vendor guarantee.

⁴ The approximate coal sulfur content values are presented for informational purposes and represent the calculated sulfur content based upon the PM, condensable emission factor and the CPM-TOT emission factor formula presented in AP-42 Table 1.1-5 for pulverized coal-fired boilers without FGD controls.

⁵ These emission rates are based upon the calculated mass emission rates divided by the CEMS derived heat input for the most recent 24-month period for which data is available (Jan-06 thru Dec-07).

(f) Table 9 contains the projected heat input rates in MMBtu/year for the 5 year projection period after the new equipment becomes operational.

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Table 9. Projected Heat Input Data with the New FF/ACI/SI Control Systems

Unit	Heat Input Rates ¹ (MMBtu/year)				
	2013	2014	2015	2016	2017
KARN 1	19,983,733	15,722,993	19,320,951	18,478,706	18,828,537
KARN 2	20,052,913	19,567,181	18,924,971	19,536,093	16,949,214
WEAD 7	9,926,611	11,133,148	11,112,572	11,464,405	11,038,738
WEAD 8	12,374,781	11,725,125	12,294,823	9,934,826	12,305,761
Totals	62,338,038	58,148,447	61,653,317	59,414,031	59,122,250

¹ The heat input rates were obtained from PROMOD and then adjusted to account for the bias recorded by the CEMS. From 2002-2007, the bias ranged from a low of 3.1% to a high of 14.4%. The calendar year 2006 was chosen as the representative year, with Karn 1 at 8.9%, Karn 2 at 9.5%, Weadock 7 at 7.9%, and Weadock 8 at 12.9%.

- (g) Table 10 contains the predicted maximum combined emissions of each criteria pollutant from the existing emission units (i.e. DEK 1&2 and JCW 7&8) after the new equipment is installed, including the PM emissions associated with the ACI and SI storage silos. [Note: Derivation of the PM emission rates from the storage silos is presented in Section C.a.(2), page 17.] The projected heat input rates in Table 9 were multiplied by the emission rates in Table 8 to determine these projected emissions over the 5 year projection period. The maximum values are presented in bold.

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Table 10. Projected Actual Annual Emissions with the New FF/ACI/SI Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
CO	859.3	801.6	849.9	819.0	815.0
NO _x	7,728.3	7,260.7	7,741.3	7,372.7	7,509.2
SO ₂	27,919.3	26,121.5	27,648.1	26,627.4	26,527.9
VOCs	103.1	96.2	102.0	98.3	97.8
Lead	0.72	0.67	0.71	0.69	0.68
PM, Total ²	1,115.5	1,044.7	1,104.4	1,065.1	1,059.2
PM ₁₀ , Total ²	1,027.8	962.7	1,017.6	981.4	975.9
PM _{2.5} , Total ²	842.6	790.0	834.4	804.9	800.2

¹ For the boiler particulate matter emissions, the particle size distributions for filterable PM₁₀ and PM_{2.5} from a fabric filter controlled unit were obtained from the AP-42. The fraction of filterable particulate matter that is PM₁₀ is 0.92 and the fraction of filterable particulate matter that is PM_{2.5} is 0.53.

² These particulate matter emission rates also include the PM emissions associated with boilers (both filterable and condensable) as well as the coal and ash handling operations.

The PM emissions from the coal handling operations are calculated consistent with the historic MAERS submittals, while the PM emissions associated with the ash handling operations are calculated consistent with the support document and related materials for Permit No. 102-06. All solid wastes associated with SI are assumed to be collected with the fly ash. The breakdown of particulate emissions between the boilers and material handling operations is displayed in Table 11.

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Table 11. Breakdown of Projected Actual Annual Particulate Emissions with the New FF/ACI/SI Control Systems

NSR Pollutant	Emissions (tpy)				
	2013	2014	2015	2016	2017
Boiler PM, Filt	467.5	436.1	462.4	445.6	443.4
Boiler PM ₁₀ , Filt	430.1	401.2	425.4	410.0	407.9
Boiler PM _{2.5} , Filt	247.8	231.1	245.1	236.2	235.0
Boiler PM, Cond	572.9	538.1	567.6	547.6	544.2
Boiler PM, Total	1,040.4	974.2	1,030.0	993.2	987.6
Boiler PM ₁₀ , Total	1,003.0	939.3	993.0	957.5	952.1
Boiler PM _{2.5} , Total	820.6	769.2	812.7	783.7	779.2
Mat. Handling PM	71.8	67	71	68.5	68.2
Mat. Handling PM ₁₀	21.4	20	21.2	20.4	20.3
Mat. Handling PM _{2.5}	18.5	17.4	18.4	17.7	17.7
PM, Total	1112.1	1041.3	1101	1061.7	1055.8
PM ₁₀ , Total	1024.4	959.3	1014.2	978	972.5
PM _{2.5} , Total	839.2	786.6	831	801.5	796.8

As discussed for Table 11, the ash handling emissions also include the additional wastes associated with SI for SO₂ control (assumed to be collected with the fly ash). This is the worst case scenario for particulate emissions. In order to target up to a 70% removal in SO₂, it is anticipated that about 3.53 pounds of sorbent will have to be injected for every pound of available SO₂. This sorbent injection rate would result in a solids by-product waste generation rate of 2.72 pounds per pound of available SO₂. Thus, the additional solid waste generation rate has been determined by multiplying the projected SO₂ emission rates in Table 8 by a ratio of 2.72. However, when evaluating the worst case scenario for SO₂ emissions, it was assumed that there is no sorbent injection (i.e., no SO₂ control through the usage of sorbent injection). Aside from the additional wastes being going to the ash handling system, the methods of calculating the PM emissions from

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the coal and ash handling operations remain the same as those discussed in relation to Table 6.

- (h) Table 12 contains the predicted maximum change in aggregate emissions of each criteria pollutant associated with the FF/ACI/SI pollution control project and illustrates that the aggregate emission change for each criteria pollutant is well below the respective significance level.

Table 12. Summary of Baseline Actual Emissions, Excludable Emissions, Projected Actual Emissions and Emission Increases (tpy)

NSR Pollutant	(A) Baseline Actual Emissions	(B) Excludable Emissions	(C) Projected Actual Emissions	(F) Emissions Change, (C - the larger of A or B)	PSD Significant Emission Levels
CO	733.8	860.9	859.3	-1.6	100
NO _x	8,527.4	7,730.6	7,728.3	-799.1	40
SO ₂	27,520.0	27,964.3	27,919.3	-45	40
VOCs	88.1	103.3	103.1	-0.2	40
Lead	0.61	0.72	0.72	0	0.6
PM, Total	1,736.1	1,772.3	1,112.10	-660.20	25
PM ₁₀ , Total	1,324.6	1,349.6	1,024.40	-325.20	15
PM _{2.5} , Total	901.0	918.2	839.2	-79.00	NA

- (2) The installation of the storage silos for the activated carbon and sodium bicarbonate or equivalent sorbent will not be subject to PSD nor result in an increase in the actual emissions of any criteria pollutant that is greater than the respective significance level.

Silo emission rates include filterable PM only (all PM is conservatively assumed to be less than 2.5 microns in mean diameter). The ACI will be received by truck and offloaded pneumatically to one of four (4) fabric filter control silos. The sorbent will be train delivered and offloaded to the SI bulk storage silo then transferred to one of four (4) fabric filter controlled SI day silos. While offloading operations are projected to occur 8 hours per day, and the fabric filter will only be in service when

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material is being transferred to the silo it is serving, the projected actual emissions have been calculated based upon the potential to emit (i.e., operating 24 hours per day) from each silo as follows:

$$\frac{600 \text{ ft}^3}{\text{Min}} \times \frac{0.005 \text{ gr}}{\text{ft}^3} \times \frac{\text{lb}}{7000 \text{ gr}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{24 \text{ hr}}{\text{day}} \times \frac{365 \text{ day}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{0.11 \text{ ton}}{\text{year}}$$

$$\frac{1000 \text{ ft}^3}{\text{Min}} \times \frac{0.005 \text{ gr}}{\text{ft}^3} \times \frac{\text{lb}}{7000 \text{ gr}} \times \frac{60 \text{ min}}{\text{hr}} \times \frac{24 \text{ hr}}{\text{day}} \times \frac{365 \text{ day}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = \frac{0.19 \text{ ton}}{\text{year}}$$

The maximum for 9 silos is therefore 1.1 tons per year.

$$\frac{0.11 \text{ tons}}{\text{year}} \times 8 \text{ silos} + \frac{0.19 \text{ tons}}{\text{year}} = \frac{1.1 \text{ tons}}{\text{year}}$$

- (3) The combined particulate emissions attributable to both the injection of activated carbon and sodium bicarbonate or equivalent sorbent and the 9 storage silos will not result in emission rates that will make the installation subject to PSD or represent an increase in actual emissions of particulate that is greater than the significance levels.

As shown in Table 12, the installation of FF/ACI/SI controls will not result in an emissions increase for any criteria pollutant. Rather, the installation of the FF/ACI/SI results in future projected actual emission rates that are lower than the emission rates that the units could have accommodated during the 5-year projection period in the absence of the project.

- b. *Rule 278(2)-(3) – The proposed project will not be subject to the federal standards contained 40 CFR Part 61 and 40 CFR Part 63.*

The installation of the FF/ACI/SI control systems will not construct or reconstruct a major source of hazardous air pollutants pursuant to 40 CFR Part 63. The total fixed capital cost of the control systems is \$260 million which is less than 50 percent of the fixed capital cost that would

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be required to construct a comparable new source. The generating capacity of Weadock 7&8 and Karn 1&2 is 821 MW and the cost for a new 800 MW coal fired electrical generating unit is in excess of \$2 billion. Furthermore, the installation does not meet the requirements for "construction" or "modification" as defined in 40 CFR Part 61.

IV. CONCLUSION

In summary, the proposed air pollution control system project is eligible for exemption from air permitting. The material storage silos are eligible for exemption under Rule 284(k). The injection of activated carbon and sodium bicarbonate or equivalent sorbent, respectively for mercury and SO₂ control, is eligible for exemption under Rule 285(f). The fabric filters with new ID fans are exempt under Rule 285(d). The combined emission changes associated with this project do not result in the project being subject to PSD or otherwise being excluded from exemption by Rule 278.

It should also be noted that on December 21, 2007 the US Environmental Protection Agency published in the Federal Register a final rule regarding the standard for recordkeeping, monitoring, and reporting related to evaluating whether projects at existing sources result in a significant emissions increase under the "actual-to-projected-actual" test. Under the Final Rule, an Electric Generating Unit (EGU) that uses the "actual-to-projected-actual" test to evaluate potential NSR applicability for a project must submit its evaluation to the permitting authority prior to the commencement of construction of the project, and must submit annual emissions reports for 5 or 10 years (depending on the type of project), if the EGU's pre-project analysis shows that the project would result in an emissions increase of more than 50% of the NSR threshold (for the pollutant at issue). If the project is not projected to result in such an emissions increase, the EGU must nonetheless keep records of its emissions increase analysis only if the projected post-project emissions -- without accounting for emission increases that are not caused by the project -- exceed baseline emissions by more than 50% of the NSR threshold (for the pollutant at issue). This R336.278a demonstration is consistent with these new requirements. Since the projected post-project emissions do not exceed the baseline emissions by more than

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50% of the NSR thresholds, records and recordkeeping is not required under the new federal rules. Annual actual emission reports will still be required to be submitted to the MDEQ through the MAERS reports.

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ATTACHMENT 1

Two AQCS projects are proposed for the Karn 1&2 and Weadock 7&8 units. One project consists of installing equipment for mercury and SO₂ reduction on all four units, while the other project consists of installing low NO_x burners on Weadock 7&8. This attachment documents why the two AQCS projects at the Karn 1&2 Units and Weadock 7&8 Units are independent of the ASCPC project and of each other for purposes of determining New Source Review (NSR) applicability.

The Projects

The following activities are being proposed:

1. Installation of fabric filters (FF) on all four units.
2. Installation of 4 silos for the storage of powdered activated carbon (PAC). The PAC is to be injected into the exhaust gases prior to the new FF to provide for the reduction of mercury (Hg) emissions.
3. Installation of 4 silos for the storage of a sorbent such as sodium bicarbonate. The sorbent is to be injected into the exhaust gases prior to the new FF to provide for the reduction of sulfur dioxide (SO₂) emissions.
4. The installation of the FFs will require new ID fans on all 4 units because of the increased pressure drop across the AQCS.
5. Installation of low NO_x burners on two units - Weadock 7&8.

Permitting Guidance and Requirements

The air permitting requirements are significantly impacted by whether or not the proposed two K/W AQCS projects need to be "aggregated" with the ASCPC permit application. Aggregation of projects is the subject of USEPA guidance.

On September 14, 2007 USEPA [Federal Register: Volume 71, Number 178] proposed "to add our aggregation policy to our NSR regulations to achieve greater national consistency and provide further clarity in aggregation determinations. This proposal clarifies our existing policy and provides specific circumstances where emissions should be aggregated for purposes of NSR applicability.

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EPA proposes to revise the regulations to state that a source must aggregate emissions from projects that are technically or economically dependent. This same policy would be used in EPA's case-by-case after-the-fact inquiry of whether a source has circumvented NSR through a failure to aggregate dependent projects." (emphasis added)

Technical Dependence

USEPA states:

"The terms "technically dependent" and "technical dependence" describe the interrelationship between projects such that one project is incapable of performing as planned in the absence of the other project. This means that, absent another project, the process change cannot operate without significant impairment, or for the planned amount of hours, or at the planned rating or production level, or that it operates in a manner that results in a product of inferior quality. This assessment examines, and applies reasonable engineering assumptions to, the planned operational levels and/or specifications that are relied upon in the company's own descriptions of and/or justifications for the project. Thus, the technical viability of one project is ultimately contingent on another project being completed (i.e., it is technically dependent)."

USEPA goes on to provide 3 indications of technical dependence.

- A project cannot operate within its maximum design parameters for an extended period of time without the other project(s).
- A source cannot achieve its maximum production without the implementation of both projects.
- If the intention for a project is to make a new product, and absence of another project would not allow for full production of the new product, then the projects are technically dependent. In this case, one project must be done by virtue of another project, or the overall project would fail to operate.

Based on these criteria and the examples given by USEPA, the ASCPC and the AQCS projects are undeniably technically independent. The FF, PAC Injection, Trona Injection, ID fan installation and LNB addition will operate independently from the ASCPC project: 1) they can operate within their maximum design parameters for an extended period of time without the ASCPC project; 2) they can achieve maximum production without the implementation of the ASCPC project; and 3) the intention of the two AQCS projects is not to make a new product

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and the absence of the ASCPC project has no effect on the AQCS projects. The addition of controls for the existing units would result in a net air quality benefit, and is solely for compliance with the state and federal NO_x, SO₂, and Hg regulations as currently prescribed and or anticipated.

Economic Dependence

With respect to economic dependency, USEPA states:

"Activities are dependent on each other for their economic viability if the economic revenues or 'Return on Investment' (ROI) associated with the project could not be realized without the completion of the other project. ROI is a measure of the worth in investing and is sometimes informally referred to as "payback," which is an equivalent concept but is a more simplistic determination of the time it takes for savings or revenues generated from a project to equal the cost of the project. ROI is generally expressed as a percentage linked to a time frame (e.g., 15 percent over 3 years). In contrast to payback, ROI takes into account the value of money over time. Economic dependence is generally evidenced when a particular project that may indeed be capable of operating technically independent from other planned projects is nevertheless planned or integrated as part of a larger project goal and is interrelated to such an extent that it is not economically viable as a stand alone project because both (or all) the projects are necessary for the larger project to achieve the operational level that justifies the investment of the planned project. While an argument can be made that all projects and activities at a source are economically linked, since they all contribute to the company's 'bottom line,' we are clearly not proposing such an approach. Our approach would require that a source treat one project as economically dependent on another if it is no longer economically viable without the completion of the other project(s). Economic viability is measured by assessing the ROI or payback of a project, such that a project is not economically viable if it does not pay for itself (e.g., yield a positive expected rate of return) in the absence of another related project." (Emphasis added).

Consumers Energy Company has announced its intention to finance and utilize only 500MWs of the 800MW ASCPC output, seeking municipal partners for the financing and offtake of the remaining 300MWs. The two AQCS projects and the ASCPC project stand on their own, and are not economically dependent on each other as evidenced by the financing and ownership structures.

Timing

USEPA also address the timing factor in making aggregation determinations. They stated: *"Under our current aggregation policy, there is no presumption that projects automatically are or are not aggregated as a result of their proximity in time. We believe that projects that happen to occur simultaneously at a source do not necessarily have any inherent relationship. Certainly, if concurrent projects occur at the same emissions unit, then there may be a greater sense of interrelationship, but it still does not provide conclusive evidence that they are*

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dependent on each other. As previously stated, the technical and economic viability of a project are the sole objective criteria that a source and reviewing authority must consider when making an aggregation determination. Timing of construction scheduling, or time horizons for economic planning, may weigh into a determination of economic or technical dependence, but timing, in and of itself, is not determinative in deciding whether to aggregate projects. The reviewing authority could, for example, review the technical and economic relation to other projects occurring within a short period of time (e.g., within 18 months) as they review activity at regulated sources but would need to determine the technical and/or economic relationship of these projects – not simply their proximity in time – to make a determination about aggregation.” (Emphasis added).

Consumers Energy is cognizant of the fact that the ASCPC permitting project may exceed the standard permitting timeline and milestones for a major air permit and may in fact intersect with the AQCS projects. Nonetheless, the ASCPC and AQCS projects are technically and economically independent and the timing of one should not impact or delay the timing of the others.

Because the ASCPC project and the two AQCS projects are independent both technically and economically as set forth above, in spite of their proximity in time, they can be permitted separately.



JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
SAGINAW BAY DISTRICT OFFICE



STEVEN E. CHESTER
DIRECTOR

March 5, 2008

Ms. Linda Hilbert
Consumers Energy
1945 W. Parnall Road
Jackson, MI 49201

Dear Ms. Hilbert:

Subject: Proposed Installation of Air Pollution Control Systems – Consumers Energy,
Karn/Weadock

The Michigan Department of Environmental Quality (DEQ), Air Quality Division (AQD), has received the information dated January 23, 2008, from Consumers Energy, for demonstrating applicability of exemptions pursuant to R 336.1278a. On February 21, 2008, the AQD received through e-mail a revision of this information submittal also dated January 23, 2008.

This demonstration for exemption is for the addition of four air pollution control systems at the Karn/Weadock Complex located at 2742 N. Weadock, Essexville, Michigan. Each air pollution control system consists of a fabric filter control, activated carbon storage and injection, and sodium bicarbonate (or an equivalent sorbent) storage and injection on each of the following coal-fired units: D. E. Karn 1 and 2, and J. C. Weadock 7 and 8.

Based on the information in your revised submittal, it appears that the installation of the air pollution control systems would be eligible for exemption from the requirement of R336.1201 for a permit to install. The AQD does not provide formal approval of exemption status and it is ultimately the responsibility of Consumers Energy to comply with state and federal air quality regulations.

Thank you for providing this information regarding the proposed installation of air pollution control systems. Please let us know if you have any questions.

Sincerely,

Chris Hare
Assistant District Supervisor
Air Quality Division
517-335-6306

ch:sks

cc: Mr. A. Kent Evans, Consumers Energy
Mr. Gerald Avery, DEQ
Ms. Mary Ann Dolehanty, DEQ
Mr. Mark Reed, DEQ

